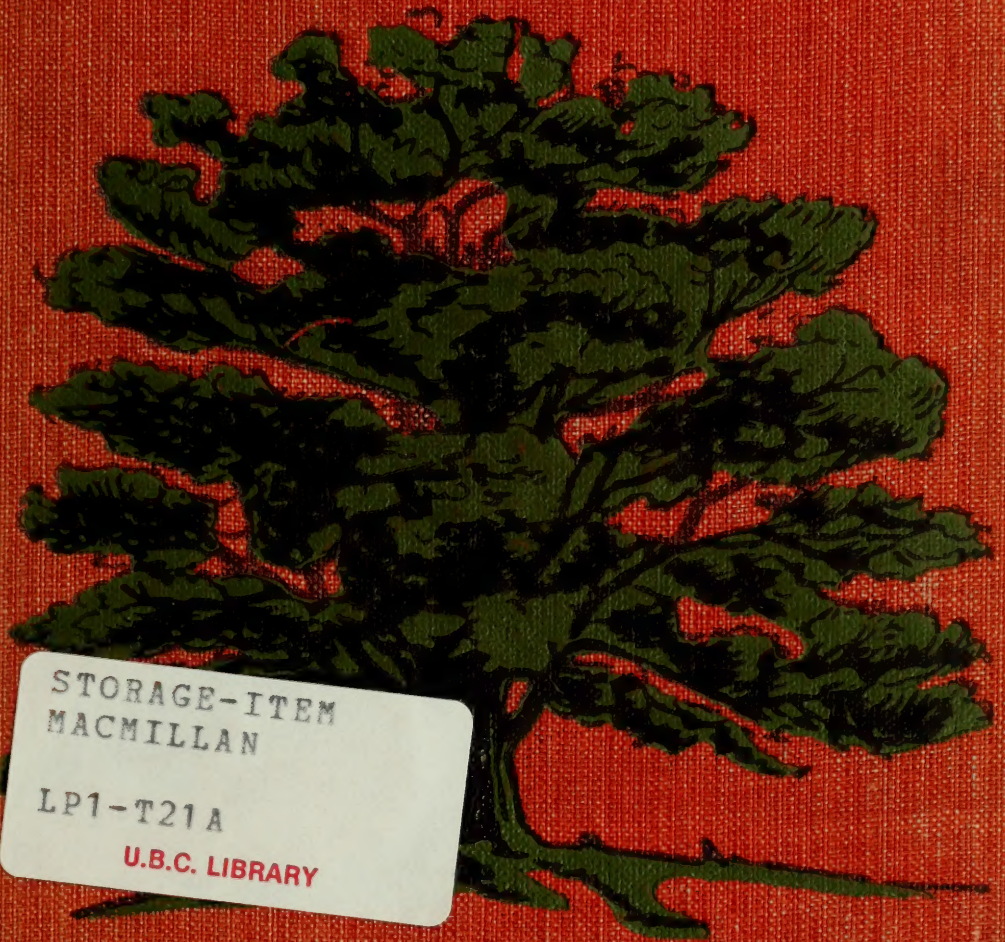


BRITISH GROWN TIMBER & TIMBER TREES



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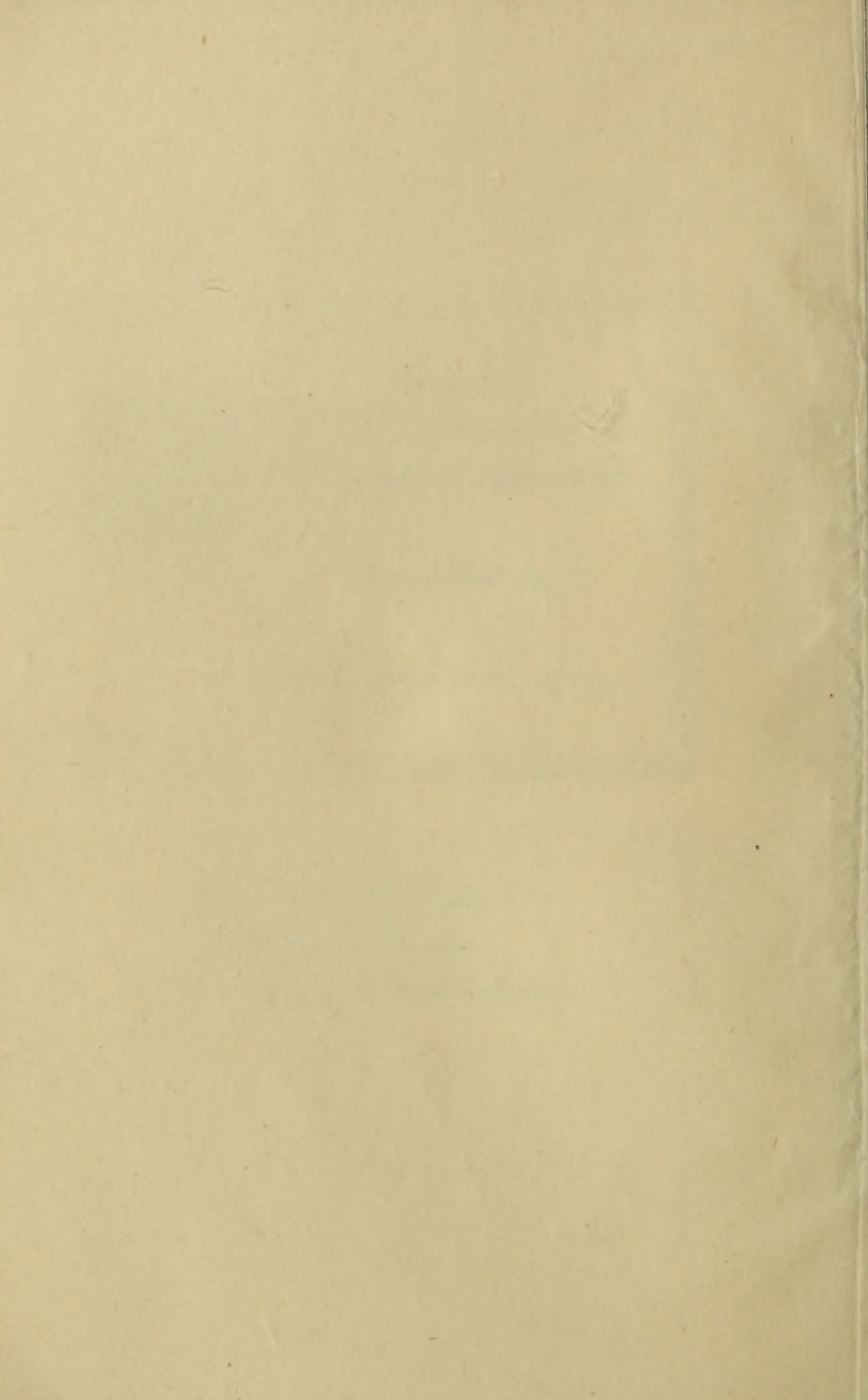
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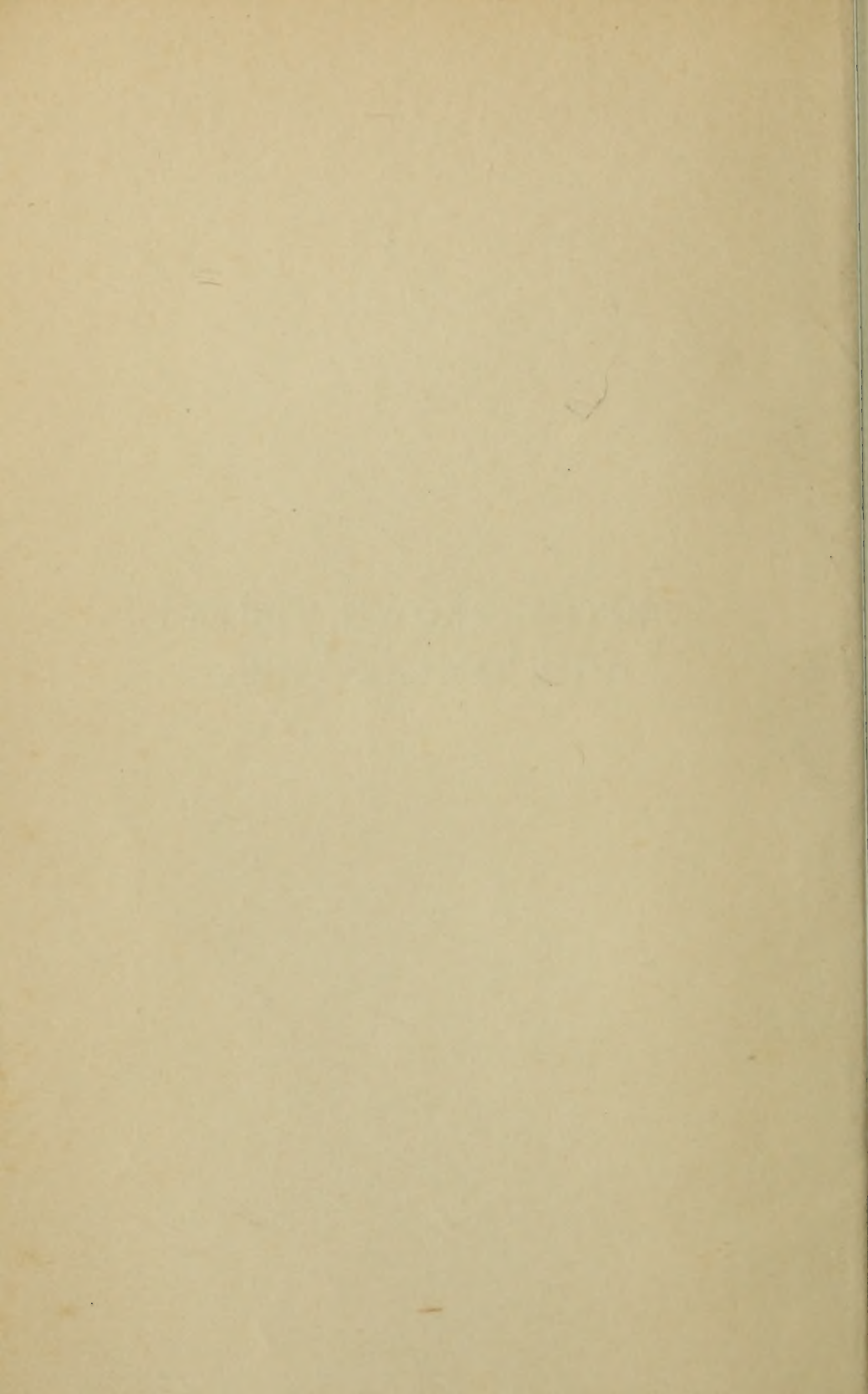
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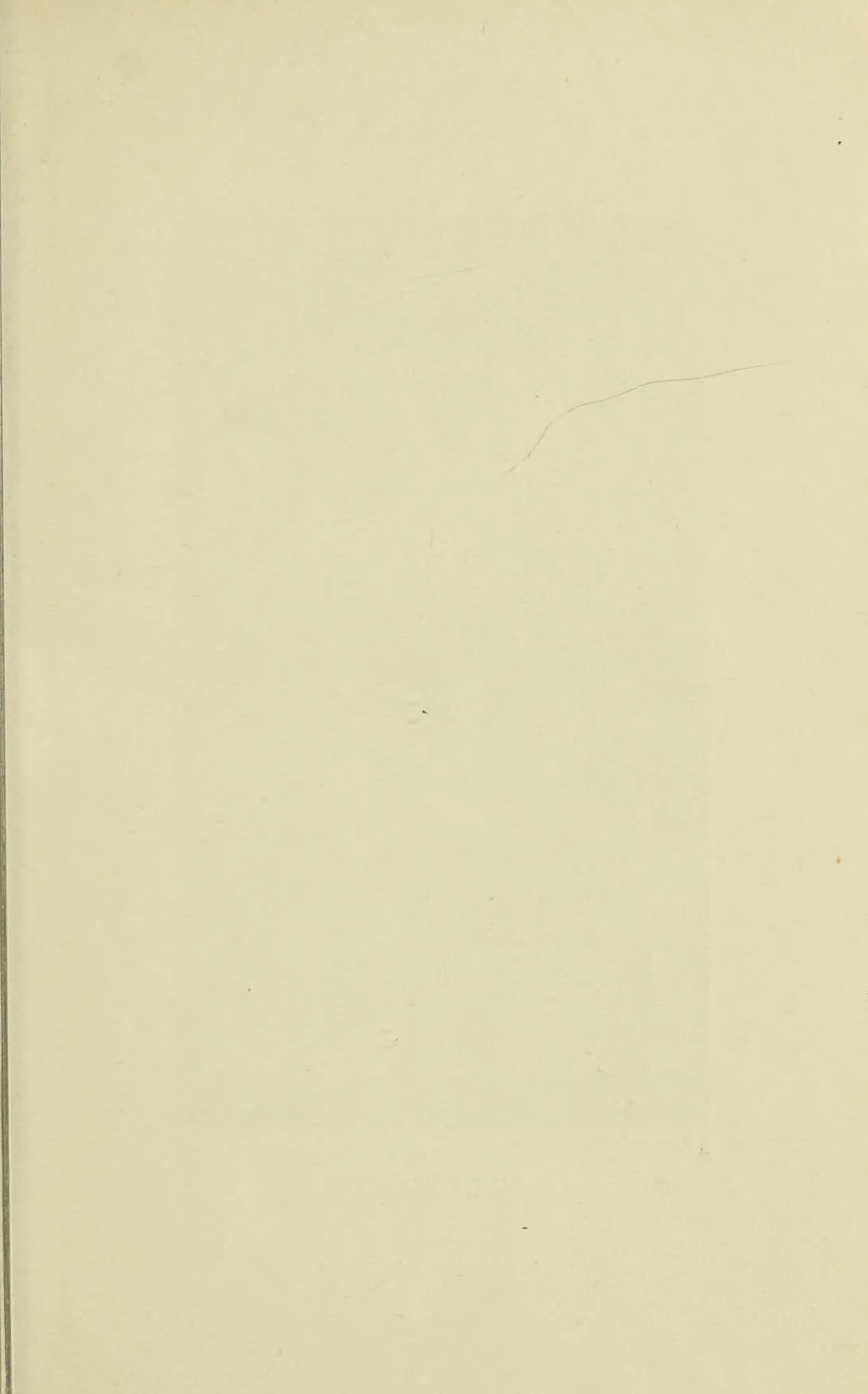
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26, Sept. 80, H. Anderson. 11, 1884.



BRITISH-GROWN TIMBER
AND TIMBER TREES







Frontispiece.

[See p. 108.]

SILVER SPRUCE

BRITISH-GROWN TIMBER AND TIMBER TREES

Being a concise description of each species, together with notes as to their value for ornamental and economic planting, including an account of the soils suited to their cultivation, the uses to which the timber is applied, the current value of the wood, etc.

BY

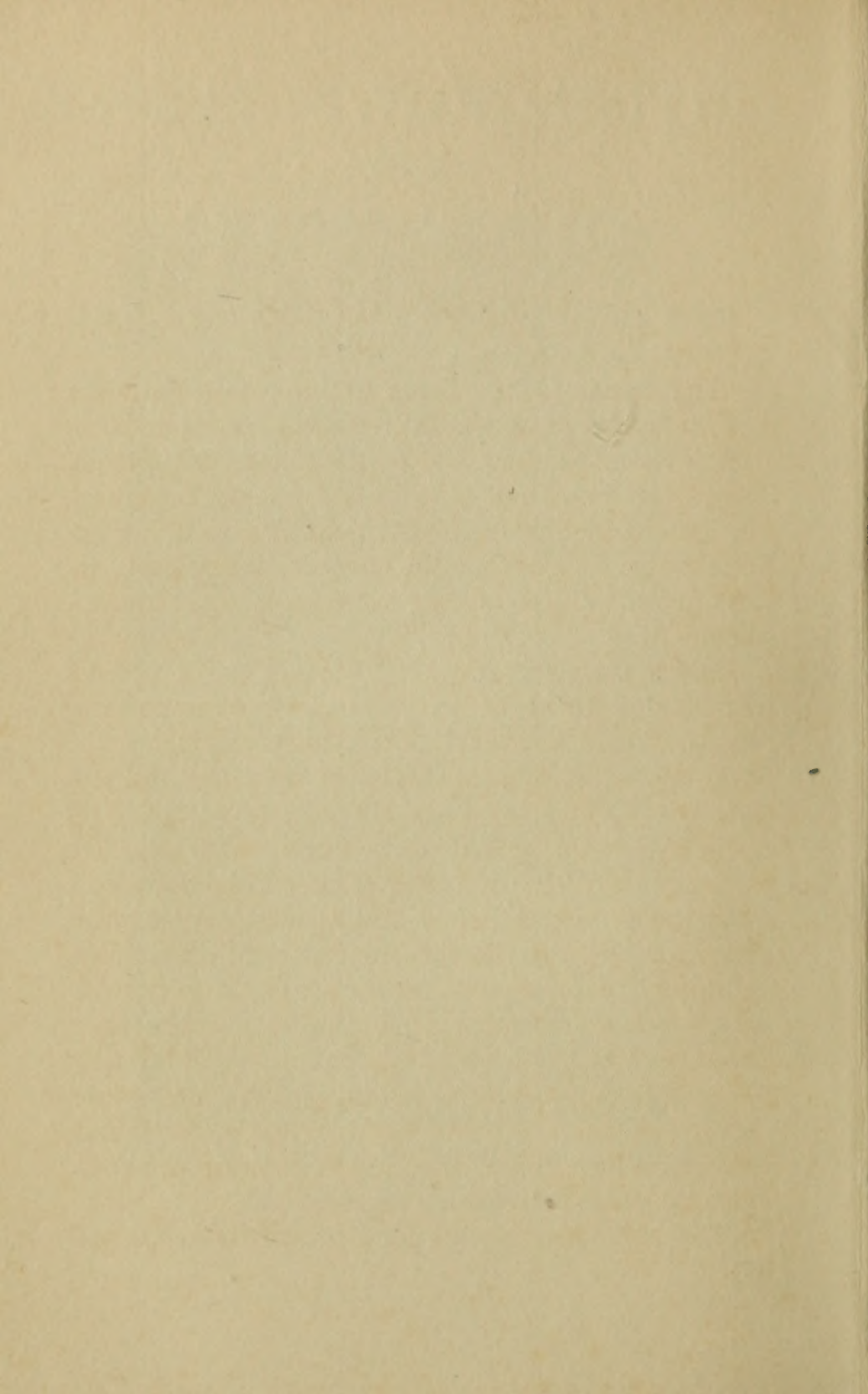
ANGUS D. WEBSTER

AUTHOR OF "WEBSTER'S PRACTICAL FORESTRY," "FORESTER'S DIARY,"
"HARDY CONIFEROUS TREES," "TREE WOUNDS AND DISEASES:
THEIR PREVENTION AND TREATMENT," ETC.

WITH FORTY-ONE FULL-PAGE PLATES

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INTRODUCTION

THE value of home-grown timber for the purposes of the architect and builder has, in the past, been but little recognised, the reason being that foreign wood, seasoned and converted for immediate use, is obtainable in such vast quantities and at so reasonable a price that the necessity for utilising to the fullest the resources of our woodlands has never before arisen.

Since the days of the "wooden walls of old England," when British Oak played so important a part, home-grown timber has been but little appreciated, and has in the main only been utilised for the commoner or less important purposes to which it can be applied on the farm and estate. To those who have little interest in our home woods and their resources, such a statement may appear strange; and all the more so as it is universally admitted that Oak and Ash timber of native growth are superior in lasting properties to any that has been sent from abroad, and that native Birch and Beech are quite equal to foreign importations, while several of our coniferous woods, when matured and seasoned, have been found of the greatest value for general constructive purposes.

The main reason why home-grown timber is not

more frequently in use amongst architects and builders is because it can rarely be got in a dry and seasoned condition and fit for immediate use, nor in the sizes, quantity, quality, and at the time required. On the other hand, foreign wood is sent to this country in a matured and thoroughly seasoned state, and can be procured in the different sizes and scantlings required for any class of constructive work, while there is no occasion for waiting on the part of the builder, as he can procure just what he wants at the shortest possible notice. It is also clean to handle and moderately cheap.

Now, however, conditions are entirely different, and with the unprecedented demand for timber of home growth, owing to lessened foreign importations, it is imperative that we realise to the fullest the wealth of our home woodlands, and at the same time aid our country in providing one of the pressing necessities of the war.

Never before in the history of this country has the demand for home-grown timber been greater or prices higher than at the present time. Since the war commenced, vast quantities of timber have been requisitioned by the Government; and what was a few years ago a purely negligible article, has now, with the shutting out of a large proportion of the foreign supplies from our markets, become a valuable asset of woodland properties. With the enormous demand for timber of almost every description, including pitwood, propwood, sleepers and scantlings, principally of coniferous trees, and heavy wood of Oak, Ash, Elm and Beech, the

home-grown timber market may be said to be quite revolutionised. At the same time, attention should be directed to the undoubtedly grave situation that this wholesale denudation of our very limited supplies is bound to bring about.

Ash timber of special size and quality is about twice the price it was before the war, owing to the demand for shafts for ammunition wagons, planks for the framing of flying machines, and scantlings for stretcher poles, to name only a few of the many uses for which it is required at the present time. For packing cases, the wood of the Scotch Pine, which a few years ago could hardly find a remunerative market, is being used in large quantities, while Spruce timber has been in demand at previously unheard-of prices.

Beech, for tent pegs, rifle stocks, saddle trees and chairs, as well as for many other important purposes, has never been so largely utilised as during the past two years; while Poplar, for wide boarding in the making of packing cases for ammunition and shells, has probably never before been in so great demand, nor realised so high a price. Willow, for the making of crutches for our wounded soldiers, has been eagerly sought after, as also Larch for telegraph and telephone poles; while the uses to which Elm has been put in the construction of carts, wagons and gun-carriages are considerable.

For heating the trenches in France and Flanders, vast quantities of charcoal and firewood have been sent from this country, the latter having increased in value around London from 10s. to, in

some cases, 15s. per cord. Chemicals, for bark-tanning, are also barred to our markets, with the consequence that the price of Oak bark has increased threefold during the period of the war. Osiers for crate-making, and wood for gunpowder charcoal, are all in special demand at greatly increased prices.

The present demand, though sadly depleting our already very limited acreage of woodlands, will at least be of incalculable benefit in drawing attention to the value and possibilities of British-grown timber. The depletion is only temporary, however, and we may rest assured that the Government, in order to make us less dependent on foreign supplies of timber in the future, will take up the question of afforestation, which has been so neglected in the past, and clothe with thriving plantations some of the vast areas of uncultivated land that are to be found in various parts of the country.

Though several of the timbers that are described and illustrated in this work can only be classed as fancy woods, yet all have been and are at present used in connection with the arts and industries of our country.

It must be remembered that the prices of the rarer fancy woods vary greatly with demand and supply.

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BRITISH-GROWN TIMBER

ACACIA

(*Robinia Pseud-Acacia*)

THE Robinia, or False Acacia, was introduced into this country from North America by the French botanist Robin in 1640. Despite the many useful purposes to which its produce can be put, the lasting nature of its timber, and its justly recognised ornamental qualities, the tree is far more in demand and more extensively cultivated on the Continent, particularly in France, than in England.

Though comparatively short-lived, the False Acacia is well suited for cultivation in the milder portions of the British Isles, where it attains to large dimensions and produces timber of excellent quality. As an ornamental tree the beautiful pinnate, pea-green leaves, and pendent clusters of pure white and deliciously fragrant flowers, place it in the first rank, while its capacity for withstanding the deleterious effects of an impure atmosphere renders it one of the most valuable trees for town and suburban planting. It can withstand long-continued drought and heat in a remarkable way, and that, too, when growing in the lightest and poorest of soils.

When grown under favourable conditions as to soil and situation, the False Acacia attains to a height of from 70 ft. to 80 ft. in this country, with a deeply fluted trunk of often a yard in diameter and a wide branch-spread when allowed full freedom of growth. The bark is furrowed and rugged in old trees and of a dark grey colour. It can succeed and attain to large dimensions on poor, gravelly, or sandy soils, as witness the numerous giant specimens that are to be met with around London, and on the light soils of Kent and Surrey. Growing on deep, gravelly beds, on the Holwood property of the Earl of Derby, in the former county, the False Acacia has reached fully 80 ft. in height, and several of the trunks that were cut into boarding measured 14 ft. in girth at 3 ft. from the butt end.

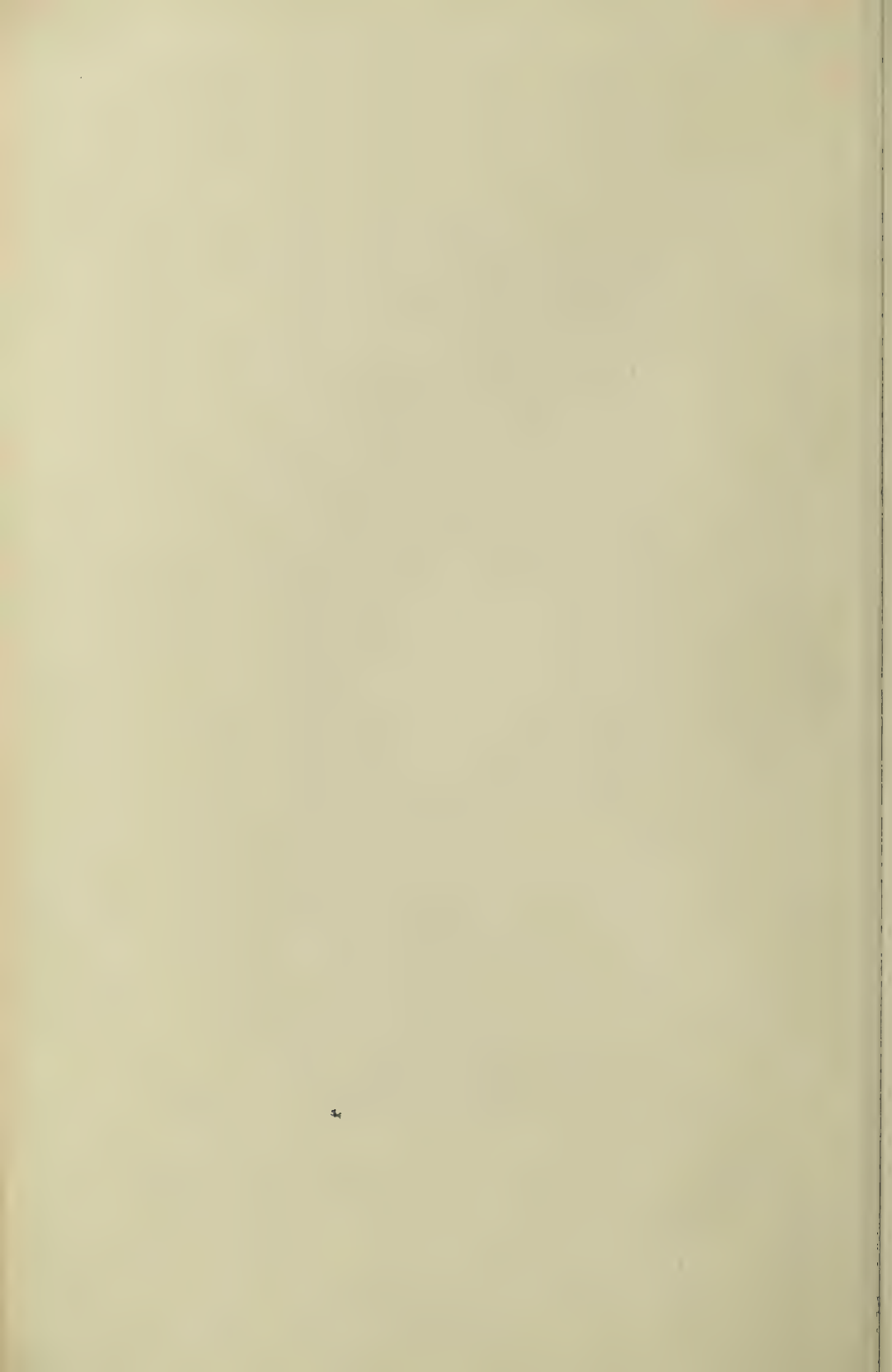
Although of rapid growth and attaining to large dimensions, the False Acacia is not a long-lived tree in this country, the branches dying back from time to time and the trees often showing signs of an incipient state of decay. This is not always, however, the result of old age, occurring as it does at all stages of growth.

In 1823, Cobbett created quite a sensation with regard to this tree, the wood of which, under the name of the Locust, he declared to be "absolutely indestructible by the powers of the earth, air, and water." He caused many millions of the plant to be raised from seed, which he distributed throughout this country and prophesied that the time was not far distant "when the Locust tree would be more common than the Oak." This, we need hardly

BRITISH GROWN TIMBER.



ACACIA.



say, has never come to pass, probably owing to the trees being only suited for the milder portions of Great Britain as well as to their early decay and short life. It is readily propagated from seed, quantities of which are borne by trees in this country, while suckers make good plants by careful manipulation.

The timber of home growth is of good quality, strong, heavy and very durable, and has stood the test of time in a commendable way. It requires slow and careful seasoning, else the boards are apt to warp and rend. In seasoning Acacia wood we have been most successful in avoiding splitting by stacking the planks in a cool dark shed. It is of a beautiful greenish-white colour, changing to dull buff or brown when quite dry, marked distinctly with brownish veins, and works readily under the tools of the carpenter. It forms heart wood when quite young. In this country it has not been extensively used, but on the Continent it is largely employed for agricultural implement making, also for the making of carts, carriage axles, posts, sills, joists and gates. For shipbuilding, the tough elastic quality of the wood renders it peculiarly suitable for making the wooden nails or pegs that are largely used in that particular industry. English-grown wood has been used for turnery purposes and largely as tree nails for gates and wooden buildings.

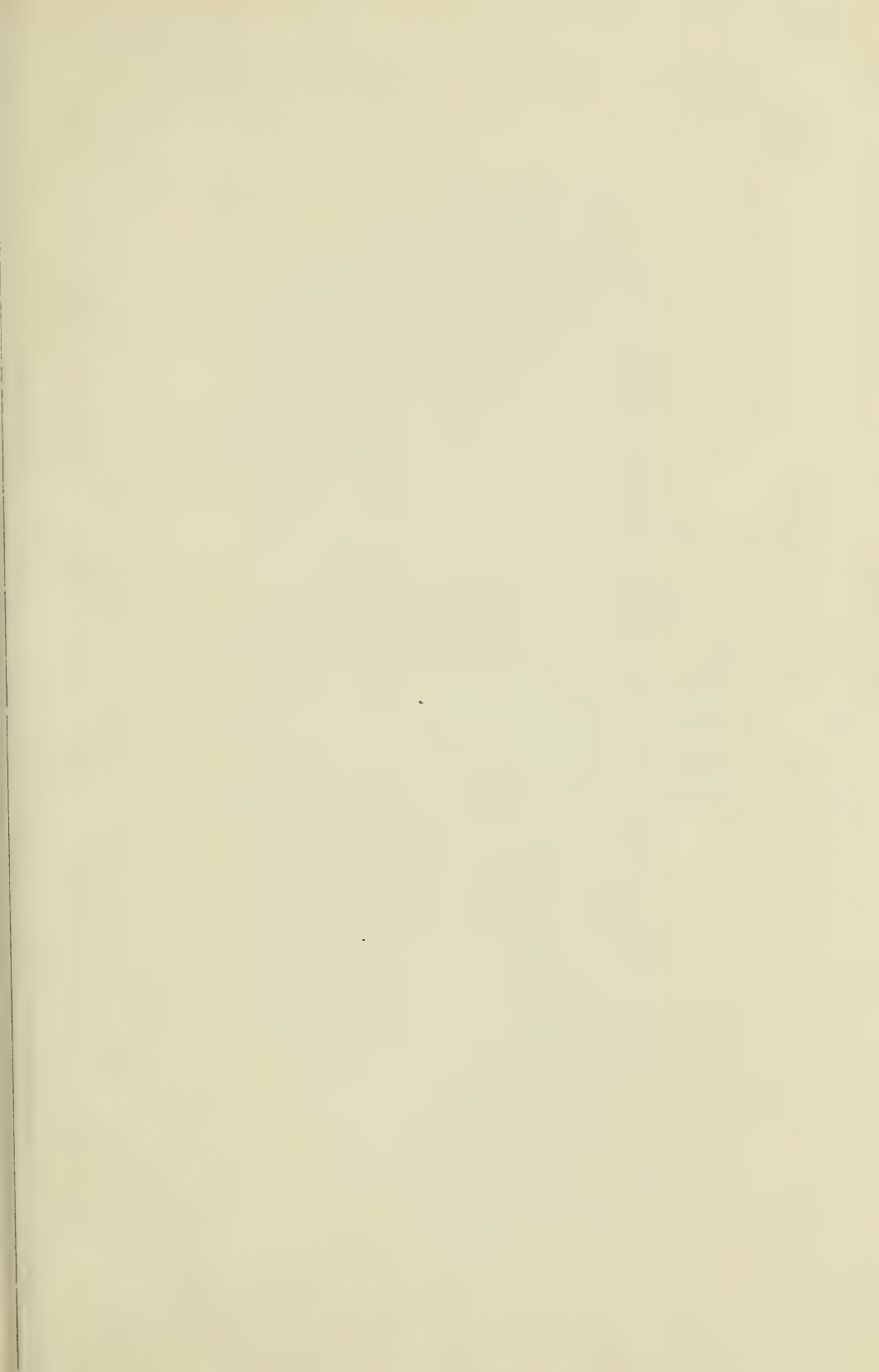
In America the wood of the False Acacia is highly esteemed, and, where strength and durability are required, its value is generally acknowledged.

Fence and gate posts of Acacia wood have been

known to be in the ground for three-quarters of a century and remain perfectly sound.

The Acacia is a comparatively scarce tree, there being few plantations composed of this species alone. The price of Acacia timber is not fixed, but the writer has sold that of large size and good quality at 1s. per cubic foot in Kent.

For a small parcel of prime Acacia wood of home growth, seasoned and in square logs, the price paid was 4s. per cubic foot on rail during the present season.



BRITISH GROWN TIMBER.



AILANTHUS.

AILANTHUS

(*Ailanthus glandulosa*)

THE Ailanthus, or "Tree of Heaven," is at once one of the most ornamental and distinct of the many species that have been introduced from China. For parks and avenues it is indispensable, retaining, as it does, its conspicuous foliage long after our own deciduous trees have been scorched by heat and drought. As a town tree it has few rivals, as dust, foul air, and the emanations of chimneys, seem to have but little effect upon it. Further, it can succeed in the roughest and poorest of soils, and even on clay the growth is rapid and the foliage well sustained. The long, pinnate leaves, like those of the Ash greatly exaggerated, are of the most pleasing green, a colour that is never absent during the whole of the season. The small greenish flowers are produced in branched panicles and succeeded, though but rarely in this country, by the fruit which somewhat resembles the keys of the Ash, but of a rich reddish-brown tint. When cut back annually, as in the flower garden at Regent's Park, the shoots are very freely produced, and the leaves become most ornamental and of giant proportions and have quite a tropical appearance.

The timber produced in this country somewhat

resembles that of the Ash, but is wider in graining owing to more rapid growth. It is hard, moderately heavy, close and beautifully grained, smooth and satiny when planed and, though somewhat brittle, is susceptible of a nice polish. For estate purposes, large trees that were uprooted by the storm have been used in fencing and last well; while small articles for indoor purposes made of the wood as long as twelve years ago, show little or no difference in appearance. The only timber of this kind sold recently in London realised 1s. per cubic foot, as part of a parcel of lime wood, and was to be used for similar purposes.

ALDER

(*Alnus glutinosa*)

WHETHER viewed from an ornamental or commercial standpoint, the Alder is a distinctly valuable tree. In damp, low-lying situations, where few other species could succeed, the Alder thrives admirably and produces a fair amount of timber, which, even in a young state, is employed for several important purposes. Indeed, a large variety of industrial wants are supplied by this tree. The favourite haunts of the Alder are along the streams or rivers or in the drier parts of marshy land. Usually, the height attained is from 40 to 50 feet though in suitable soil and when growing by the water-side, specimens from 70 to 80 feet in height may be found. The Alder is little subject to disease or insect attack, and may be readily raised from seed, which it produces in abundance.

The principal uses to which the wood of the Alder is applied are the manufacture of gunpowder and the making of clog soles. Clog-making is evidently a time-honoured industry of our country, for we learn that in 1200 the English archers petitioned the King to prohibit the clog-makers using aspen, or there would be a shortage of wood for their bows and arrows. The best wood for the manufacture of

clog soles is, however, that of the Alder, though for inferior wear that of the Birch, Lime, Sycamore, Willow and Wild Cherry is occasionally used, but, with the exception of the Birch, not to any great extent.

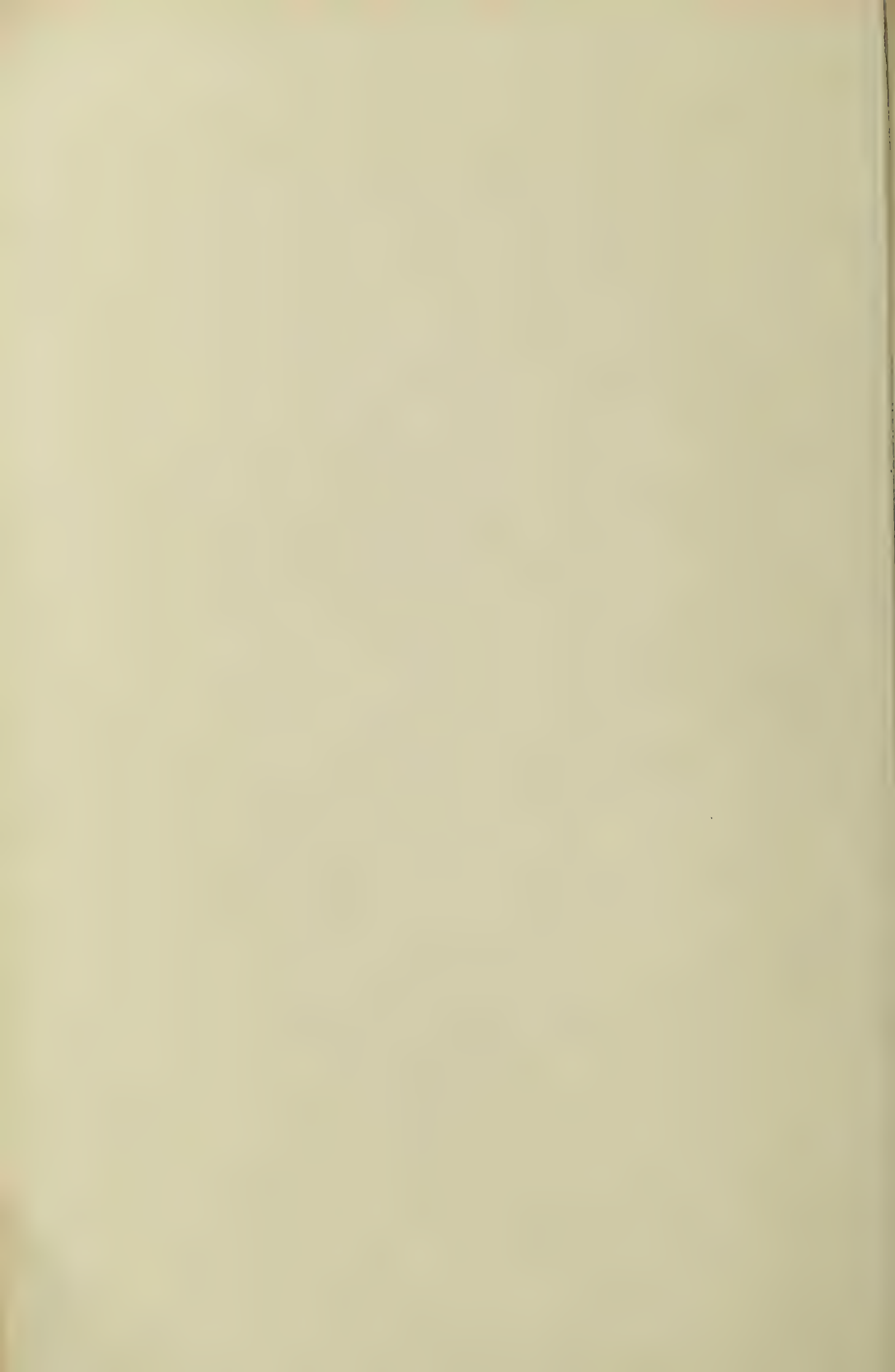
When fresh felled the timber of the Alder is white, but quickly turns to a bright red and afterwards a pale pink, the latter colour being permanently retained. Unlike the timber of most other trees there is no heart wood in that of the Alder. Although lasting only for a short time when exposed to the weather, Alder wood is extremely durable under water, and for that reason has been extensively used in piling; and in olden times, when hollowed out, it was employed as pipes for the conveyance of water underground. In the Midland counties especially, large quantities of Alder timber are consumed in the manufacture of clog soles, these being roughly hewn out in the woodland and finished off by the clog manufacturers in the Lancashire towns where the trade is principally carried on. Before the war it was estimated that fully seven thousand men were employed in the clog-making industry.

For ease in working, clean trees of from twenty to forty years' growth are preferred, and such as are found in close woodlands are superior to those from field and hedgerow, owing to the timber being comparatively free from knots and other defects. If the roads are good it matters little what may be the distance from the port or railway station to the plantation in which the trees are felled, for as a rule

BRITISH GROWN TIMBER.



ALDER.



the clog soles are roughly formed in the woodlands and despatched for finishing to the larger centres of industry where clogs are worn. The cost of carriage of timber in the round is thus avoided, the roughly formed soles being carted to and despatched from the nearest loading station, as the work can be equally well done in the woodland as in the workshop.

The making of clog soles is an art which can only be successfully practised after years of practical experience. The clog-maker likes his outdoor life and works with an ease and grace that is surprising, and which is probably unequalled in any other branch of timber conversion by manual labour. When a sufficient number of trees are felled within a reasonable distance of each other, the clogger's tent is pitched. This is usually a tarpaulin-covered shed with a log for a seat, and bench, and is heated by a fire of chippings or waste of the clog soles. The clogger's tool resembles a stout short scythe-blade, which is worked on a swivel joint attached to a bench, or form, about four feet long and a couple of feet in height. One end of this rudely constructed knife is fitted with a handle for ease in manipulation, while the other is securely fixed between iron up-rights to the bench, these being sufficiently wide apart to allow room for plenty of play. It is surprising, how, with a few dexterous and well-directed movements of the knife, the roughly split block of Alder wood is converted into the clog sole; the rapidity of workmanship is marvellous, for we have watched an expert clog-maker turn out twenty pairs

of these soles in an hour. In shaping soles from the timber no waste is allowed, as the smaller wood of the top comes in equally well with the large for the bottoms of children's footwear. The various sizes of clog soles are from 6 to 12 inches long, 2 to 3 inches wide and 1 to 1½ inches thick.

For clog soles Alder is preferred to any other wood, because it is light, easily worked, and does not readily splinter by nails being driven into it, the latter property being a necessity on account of the number of sprigs that are used in fastening the upper to the sole. The price of Alder timber varies a good deal according to locality and demand, but, from returns just to hand, 8*d.* per foot would appear to be a fair average for clean trees, with a stipulation that the wood may be roughly converted on an open portion of the plantation where it is felled. Nothing is wasted by the clog-maker, the refuse chips being sold locally as firewood at from 3*d.* to 6*d.* per sack and the branches as kiln faggots at from 8*s.* to 10*s.* per hundred.

Strange as it may seem, the best Alder for clog soles was, until lately, exported from Germany, and large numbers of the trees have been planted in the State forests by the German Government. It has proved a profitable speculation, considering that the timber at the age of twenty years may be utilised and is worth at least 5*d.* per cubic foot. Cheap German clogs have also been sent to this country, the soles being made of inferior and more porous wood than that of the Alder, but they were not in demand and realised only low prices on the

market. In this country, the largest quantity of the best Alder timber is produced in Scotland, followed by Ireland and the South and West of England and Wales.

Next to the Alder Buckthorn (*Rhamnus*), Alder-wood makes the best gunpowder charcoal, and large quantities are annually used for that purpose. Numerous other industrial wants are also supplied by the Alder, such as barrel staves, water pipes, boards for carts and wheel-barrows, artificial limbs, broom and rake handles, mill bobbins and cheap furniture. Though not so valuable as Oak bark, that of Alder is used for tanning purposes, owing to the quantity of astringent matter it contains. A useful dye is also made from the Alder. The timber is occasionally subject to insect attack, which painting with creosote or carbolineum averts.

In this country, the plantations of pure Alder are few and far between, a matter for regret, as it is one of the hardiest of trees, and, moreover one that will produce excellent timber in water-logged soils where few other species could exist. In addition to this, the timber is of value at a comparatively early age, and has special qualities which recommend it for employment where most others would be either unsuitable or greatly inferior in value. The price of Alder timber varies from 7*d.* to 10*d.* per cubic foot in the woodland, the latter price having been received for many years by the writer on an estate in Wales.

ALDER BUCKTHORN

(*Rhamnus frangula*)

THE Alder Buckthorn, berry-bearing or black Alder, is a native shrub that occurs in some plenty in Southern England, though it is seldom found either in Scotland or Ireland. Confusion sometimes arises from the same popular name being applied to widely different species of plants, and this, unfortunately, is the case with the shrub in question. What is known among gunpowder manufacturers as dogwood is in reality the present shrub (*Rhamnus*), which, however, is quite distinct from the true dogwood (*Cornus*) and belongs to an entirely different family. To those who contemplate growing charcoal wood for the making of explosives, this distinction is of the utmost importance, as we have seen *Cornus sanguinea* cultivated for the making of gunpowder.

The Alder Buckthorn is perfectly hardy, growing freely even in the North of Scotland, where it ripens its seeds. It is usually found as an erect-growing bush from 8 feet to 10 feet in height, though in suitable situations in Southern England specimens fully 20 feet high, with stems 6 inches in diameter, are to be met with. The bright green leaves are oval in shape and vary, according to

BRITISH GROWN TIMBER.



ALDER BUCKTHORN.



conditions of growth, from 2 inches to 3 inches in length, while the flowers are of a dull yellowish-green, and are succeeded by dark purple berries each about the size of a pea. From a very early date the Alder Buckthorn has been cultivated, though not extensively, in this country for charcoal-making; and the price, from £12 to £15 per ton, that is paid for the wood, shows that the growing of this shrub is a profitable undertaking. At one time large quantities of the wood were produced in Sussex and other counties, the selling price being £14 per ton when peeled and tied in bundles.

The cultivation of the Alder Buckthorn is nearly similar to that of the osier for basket-making, and the produce is dealt with and disposed of in like manner. For soil any good loam inclined to be dampish will suit it well, and an open, but not wind-swept, situation should be chosen for its cultivation. The land intended for growing the Alder Buckthorn should be trenched the winter before planting, and a top-dressing of leaf soil or thoroughly decomposed manure, the former preferably, will greatly assist the growth of the young plants and prevent too speedy evaporation of moisture from the soil. Young plants are not offered in quantity in our nursery catalogues, and in order to obtain a stock sufficient to form a plantation, seed-sowing or layering old plants must be resorted to. Fortunately, by either method the plant is readily obtained in quantity, and as the seeds are produced in fair abundance and ripen freely, this method of getting up a stock is to be recommended.

The berries, after being collected in the early winter, are treated much in the same way as those of the yew and holly : that is to say, they are mixed with sand to separate the seed from the fleshy covering, and the whole sown during early spring in previously prepared beds. The seed beds may be formed in any shady situation out of doors, the soil being largely composed of light sandy loam mixed with finely riddled leaf-mould. Sometimes the seeds are sown in boxes and placed in a cool frame, but we have found cultivation out of doors more reliable. When two years old the seedlings should be transplanted into lines 18 inches apart and 9 inches from plant to plant. Here they may remain for another two years, after which they should be planted out permanently and headed back the following season. Rather thick final planting is to be recommended as the shrub, being of upright growth, requires comparatively small room for development, and the best wands are produced by a close order of growth, say, 5 feet from plant to plant. Layering does not produce such upright-habited shrubs as those grown from seed, and the yield of wood per acre under exactly similar conditions of growth is greatly in favour of seedlings.

After planting, the ground should be kept free from rough-growing weeds for the first two years, the crop being cut at from six to seven years' growth, when the wands are usually from $1\frac{1}{2}$ inches to 2 inches diameter at the butt end. Cutting and bundling is generally done by contract, but, as with the osier, it is imperative that the crop be cut over near

ground level and short " stumps " without " spurs " encouraged.

As in the case of ordinary coppice wood, the Buckthorn for charcoal-making may be cut every sixth or seventh year, the straightest shoots when sorted in about 5 feet lengths being tied in bundles which are about a yard in girth. The Buckthorn being a gross feeder, manuring the land after the removal of a crop has been found advantageous.

Although largely imported from Holland and other parts of the Continent, home-grown wood is preferred, as it produces a much superior charcoal for the manufacture of explosives. Unfortunately, however, home supplies are so limited that foreign wood is imported in considerable quantity, and as there was a scarcity before the war, the probabilities are that, with our greatly increased consumption of charcoal explosives, a dearth of suitable wood is now being felt.

With the present small remuneration for coppice or underwood, which under ordinary circumstances does not exceed £4 or £5 per acre, the cultivation of the Alder Buckthorn is to be recommended, particularly as the price is at least quadrupled, the cultivation quite as simple, while the quality of soil required need not be better than that which produces a crop of chestnut or hazel. In cultivating the Alder Buckthorn for charcoal purposes the following rules should be observed—

1. It will not succeed satisfactorily in sandy, poor, or water-logged soils; rich, well-manured loam being preferred.

2. The ground should either be trenched or ploughed and cleared of all rough-growing weeds the winter before planting.

3. Plant seedlings or layers in the spring in lines about 5 ft. apart, the same distance being allowed from plant to plant.

4. An annual clearance of weeds and loosening of the soil between the rows of plants is to be recommended where a heavy crop is expected.

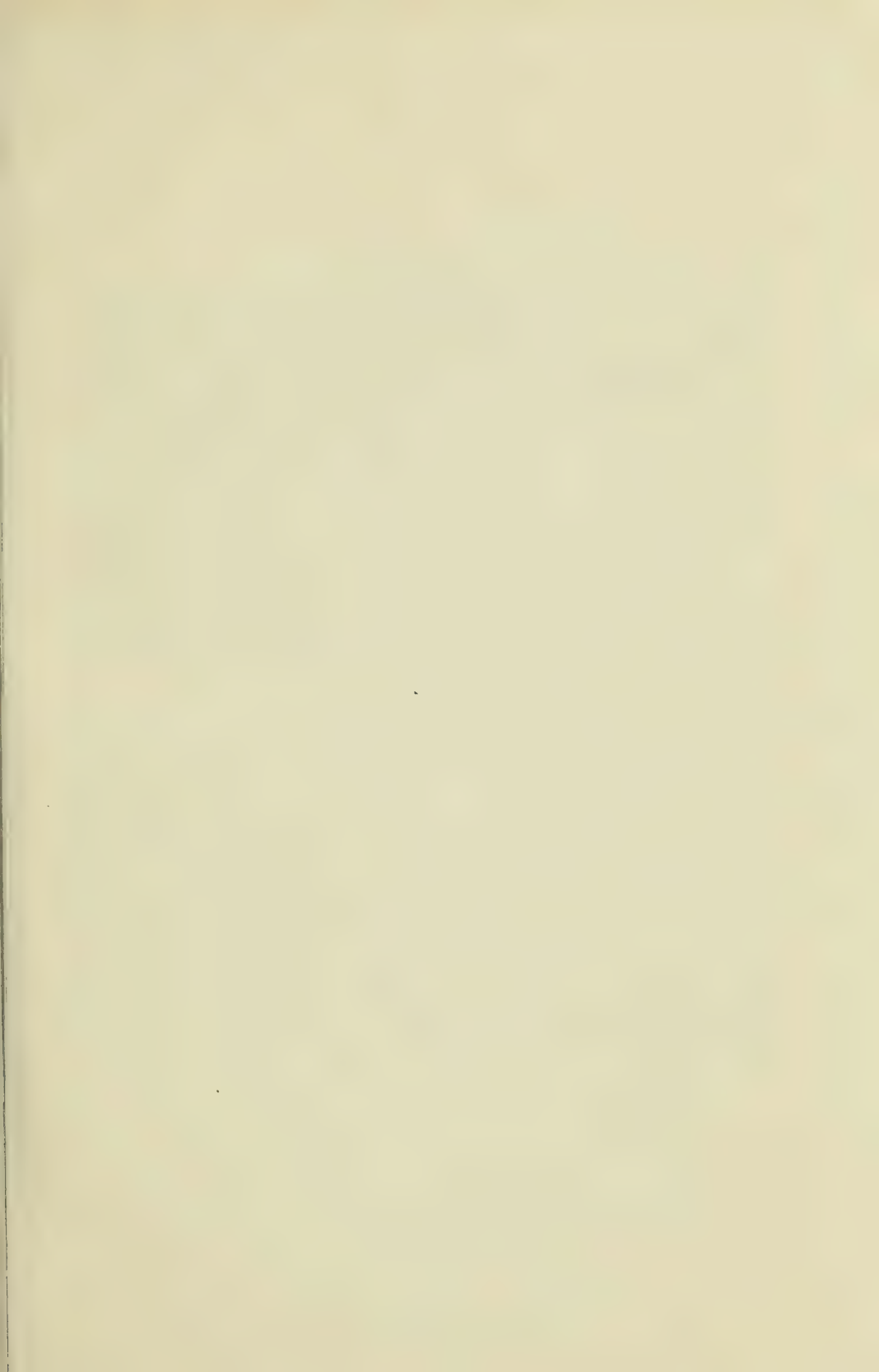
5. Induce the growth of stout clean shoots by liberal feeding and clean cultivation.

6. Cut the shoots close to the ground, so as to prevent the formation of long spurs and minimise the number of offshoots. Clean cutting with a sharp tool is imperative.

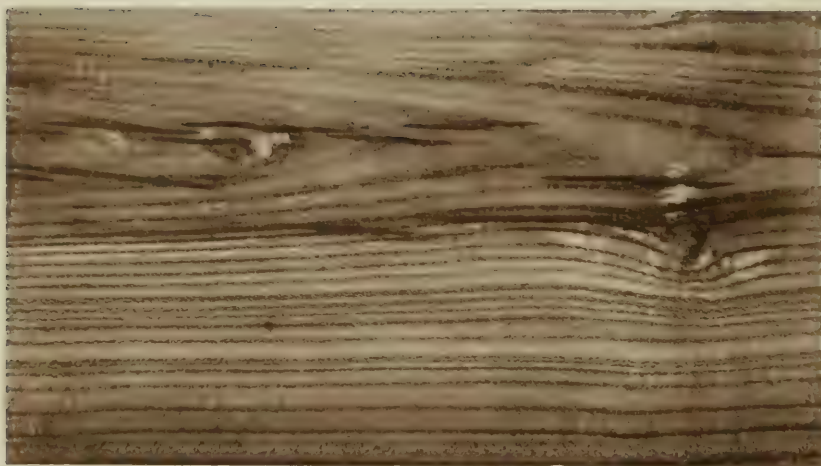
7. After the removal of a crop, stirring and enriching the soil is to be recommended.

8. Though found mixed with undershrubs and in the shade of trees when in a wild state, yet the greatest quantity of the most valuable wood for charcoal-making is produced in open situations.

The timber of the Alder Buckthorn is heavy, close-grained and smooth when polished, and of a rich reddish-brown colour towards the centre when of mature growth.



BRITISH GROWN TIMBER.



ALMOND.



APPLE.

ALMOND

(*Amygdalus communis*)

THE common Almond is so extensively cultivated in and around our larger centres of industry, that samples of the timber frequently find their way into the market. Of course, as an ornamental flowering tree of small and compact growth it is most valuable, and around London is one of our most cherished and lovely of early flowering subjects. It stands smoke and a heated atmosphere so well, and is so indifferent to the class of soil in which it is planted, that dwellers in large towns and cities claim it as their most valuable shrub or tree.

Flowering freely before the leaves are produced, the blooms, being of a pleasing shade of pink, render the Almond one of our foremost subjects for the ornamentation of the shrubbery border. It is equally effective when used as a lawn or park standard, for which its neat, somewhat upright habit of growth renders it peculiarly suitable. Further, being of small height, rarely exceeding 25 feet, it is adapted for planting in confined spaces where taller-growing trees of more spreading habit would be quite out of place. In planting, it may just be as well to remember that the large-fruited

form is, for size and beauty of flowers at least, preferable to the commonly cultivated species.

Regarding the timber of the Almond it is, as far as colouring is concerned, one of the most beautiful and distinct of any grown in this country. In well-developed trees it is of an amber-yellow colour, with irregular longitudinal markings of a lighter shade. It is hard, compact, light for its bulk, and works well and smoothly, taking a nice surface polish. Some of the logs offered for sale of late have been over a foot in diameter, and when sawn up produced nice, wide, workable boards, that have been used for a variety of indoor purposes. In combination with other lighter coloured timbers it is particularly effective; but as it can rarely be procured of large size, it is mainly used in the making of fancy articles of ware.

For twenty trees 1s. 6d. per cubic foot was lately obtained, the timber being straight and clean.

The timber of the Peach, another species of *Amygdalus*, approaches that of the Almond in colour and graining, but is a comparatively lighter wood.

APPLE

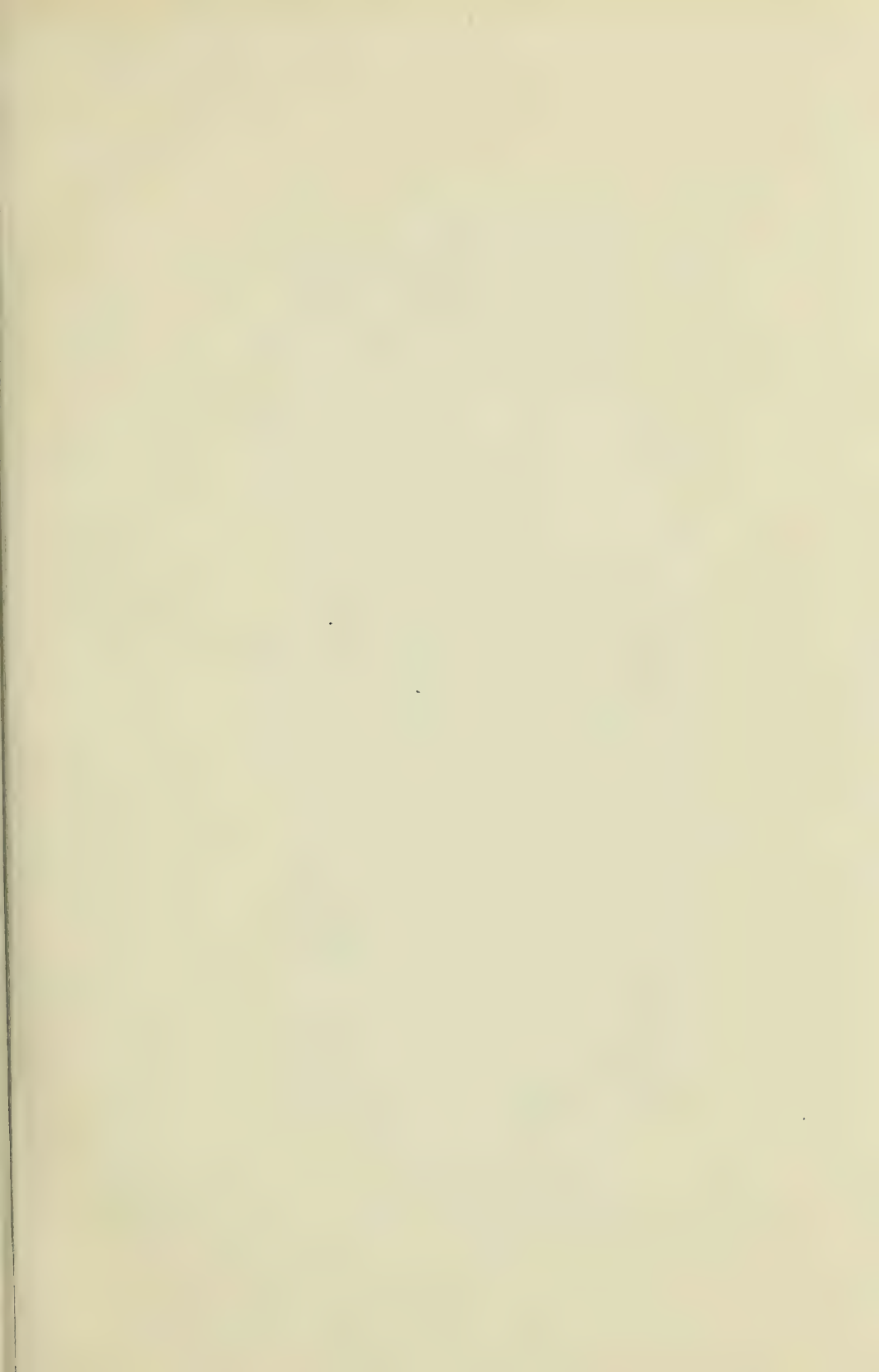
(*Pyrus Malus*)

APART altogether from its ornamental aspect and value as a fruit producer the wood of the Apple is highly prized for certain specific purposes, especially where great strength and tenacity are points of first consideration. For machinery cogs, where those of wood are still in use, it has no equal amongst our home-grown timbers, while in the making of mallet heads it is preferable to any other wood. There is some similarity in the wood of the Apple and the Pear, but the former is by far the most satisfactory, that of the Pear being decidedly softer and succumbing more quickly to wear and tear.

From the limited supply and demand the timber of the Apple is rarely taken into account, though of late years in the making of golf-sticks small parcels of fairly large, sound timber have found a ready market. Apple wood is also used for cabinet purposes, and, when stained, in imitation of most foreign woods, such as rosewood and walnut. It is used also for golf-clubs, tool-handles, bowls, wainscotting, and ship fittings. It makes excellent firewood. The principal markets are London and Glasgow. The price is difficult to state, but several small parcels with which we have lately had to deal

were quickly disposed of at 40s. per ton weight. But the market is erratic owing to the small quantities offered for sale.

Upwards of two hundred stems of apple, pear and cherry were lately sold in Kent at a price which worked out at fully 1s. 6d. per cubic foot; while 3s. 6d. per foot, tape over bark, was paid for a parcel of large, clean, thoroughly seasoned trees, delivered on rail, last summer.



BRITISH GROWN TIMBER.



ARBUTUS.

ARBUTUS

(*Arbutus unedo*)

THE Arbutus or Strawberry tree is a native shrub or small-growing tree that is alike valuable for its rich reddish-brown bark, the almost incessantly produced bell-shape flowers, and for the wealth of conspicuous strawberry-like and highly coloured fruit with which it is adorned for the greater part of the year. The leaves, too, with which the reddish shoots are covered, are persistent, of the darkest green and highly ornamental.

The Arbutus in some parts of the country, as at Gwydyr Castle in Wales, but particularly in the South of Ireland, forms a large bushy tree that often attains to fully 30 feet in height with a trunk up to 18 inches in diameter at breast-high. The timber, which is hard, nicely veined, and susceptible of a smooth polish, is highly valued for turnery and for cabinet-makers' work. We have seen beautiful specimens of the wood offered as souvenirs of the famous Lakes of Killarney, and on one of the islands many trees were noticed that were 20 feet high and over.

Evidently the Arbutus thrives best on a rocky formation, and at Gwydyr Castle and other places on broken slate rock, where the Weymouth Pine also

thrives, the Arbutus is most at home. The timber lasts well when converted, and several articles of furniture made of Arbutus wood look quite as sound at present as they did fifty years ago. There is no fixed price for the wood as it is rarely obtained in quantity, but several single trees which contained from 10 feet to 15 feet of wood each brought 2s. per foot in the Metropolitan area last year.

ASH

(*Fraxinus excelsior*)

FROM a commercial point of view the Ash is at the present time probably our most valuable timber-producing tree. For ornamental effect it is rarely planted, though its stately form and emerald-green foliage render it admirably suited for planting in certain well-chosen parts of the landscape, such as in the centre of a bold group of dark-foliaged trees or standing alone near the end of a wide glen or glade.

Throughout the country generally the Ash is highly valued as a timber-producing tree, and in many districts from the time it has reached the size of a walking-stick can most profitably be disposed of. The Ash succeeds best in a fertile loam, though large quantities of valuable timber have been produced by the tree when planted on a black, peaty soil and in a low-lying, dampish situation. Like the Oak, however, the Ash flourishes on a great variety of soils and on that of a clayey nature grows to a large size and produces excellent timber. On poor light soils, though the Ash may succeed, the timber is not nearly so valuable, being brittle, short grained and often affected by black rot. Unlike the majority of our forest trees the Ash must be grown

quickly and cut down when of full size, in order that the best quality of timber may be produced. The timber of the Ash is yellowish-white, with longitudinal yellow streaks or markings, close and long grained, elastic and pliable, and of moderate weight ; it works smoothly and readily under the tools of the carpenter. It also possesses great elasticity and bears cross strain well, though apt to split longitudinally. In order to procure the most lasting timber the Ash should be felled in winter, and the wood thoroughly seasoned. To ensure the latter, and avoid shake and crack, the best way is to have the trees cut into planks and stored in a cool, shady place till required for use.

The uses to which Ash timber is applied are many and varied. For the making of agricultural implements Ash has no equal, as it can readily be bent or curved as required, while its lasting properties render it peculiarly suitable for the strain and out-of-door exposure to which these tools are subjected. When of clean growth and good figure it is sawn into boards for furniture and is the chief wood employed by the wheelwright in the making of carts, barrows, and for felloes, while for shafts and tool-handles, such as spades, forks and shovels, the wood of the Ash has no equal amongst our home-grown timbers. In the construction of aeroplanes, where great strength, length of grain and lightness are points of special importance, the best class of Ash timber is now largely employed. But in addition to the above, Ash of smaller dimension enters largely into the making of hoops for casks,

BRITISH GROWN TIMBER.



ASH.



crates, hurdles, stakes of all kinds, walking-sticks, hammer-handles, bobbins and toys, and also for the best class of wooden rakes. Ash coppice is more valuable than that of any other wood. What is known as black heart, or black rot, attacks the timber of the Ash, especially when grown on light, gravelly and other unsuitable soils. Insect and fungoid attacks are also common in the case of the Ash, particularly when the tree is in an unhealthy condition. The goat and wood leopard moth, as also the Ash bark beetle, are most dreaded.

The price of Ash timber never was higher than at present, and the demand far exceeds the supply. Plantation-grown trees that are long, clean and branchless for the greater part of their length, are most in request and the price varies up to 4s. per cubic foot. The average price would be much less, say, 2s. per foot, but the higher figure has often been reached for special trees during the past twelve months. Field and hedgerow trees that are usually rough and knotty realise only about one half the above prices: the greatest demand at present being for those of plantation growth, which, owing to standing in close order, produce clean timber of the greatest value. For aeroplane construction as much as 12s. 6d. per cubic foot has been paid in London for the best quality of thoroughly seasoned Ash timber, with the proviso that all unsuitable wood is returnable to the merchant.

ASH (MOUNTAIN, OR ROWAN TREE)

(*Pyrus aucuparia*)

As an ornamental berry-bearing tree of small growth the Rowan, or Mountain Ash, is widely recognised. The name Mountain Ash has arisen from the circumstance that the leaf of this tree nearly resembles that of the common Ash, though specifically they are quite distinct. When laden with its bundles of bright scarlet berries, the Mountain Ash forms a most pleasing and conspicuous object in the landscape, and equally so in spring on account of its flat-headed corymbs of strongly scented, creamy-white flowers. Though thriving well in rich soil and lowland situations, yet the Rowan must be recognised as a mountain tree. Mixed with Birch and Pines it attains to greatest perfection amongst the rocky crags of its upland situation. It rarely exceeds 30 feet in height with a trunk not over a foot in diameter.

The timber, which is hard, smooth-grained and takes an exquisite polish, is, when large, of considerable value for machinery framing, and cut into three-quarter inch boards is used for cart-lining. When small it is used in making crates, for archery bows, and turning purposes generally.

As the timber of the Mountain Ash is comparatively rare, it is usually sold in conjunction with others of home growth, and in several cases has changed hands at from 8*d.* to 10*d.* per eubic foot.

BEECH

(*Fagus sylvatica*)

WHETHER viewed in an ornamental or commercial sense the Beech is one of the most valuable of our forest trees. It is of noble growth, and justly admired for its stately crown and wealth of beautiful green foliage, which render it a desirable subject for the ornamentation of our parks and pleasure grounds. The trunk is erect and massive, from 100 to 130 feet in height, while its foliage, which is of the softest and most delicate, changes considerably during the season, being of a light almost pea-green in early spring, gradually becoming darker as the season advances, till the autumn tints appear, when the leaves assume a warm russet-brown or orange colour, when they quite light up the surrounding landscape. Towards November they become withered and dry, shrivel up and fall to the ground, though in the young trees, particularly in exposed situations, the leaves often remain until they are forced off by the swelling of the buds in spring.

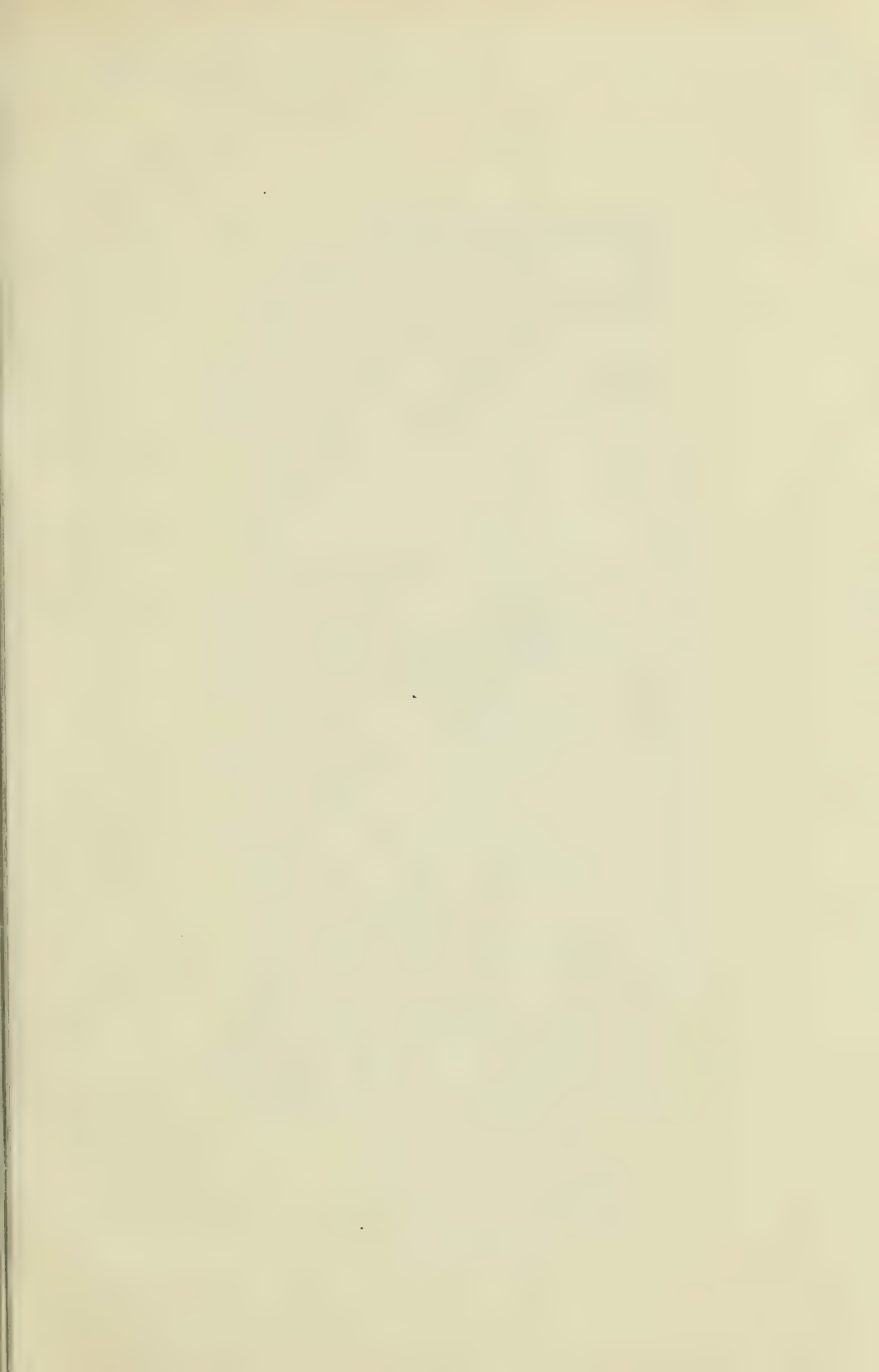
On young trees the bark is of a soft, greenish-grey hue, but as the tree becomes mature it gradually assumes a beautiful ashen-grey colour. Both leaf

and blossom buds are long, cone-shaped and sharp pointed; and the fruit, which ripens in October, consists of rough capsules, each of which contains three smooth triangular brown nuts. Though extensively planted in Britain and establishing itself readily as a naturalised tree, the Beech can hardly be considered as a native, since we find no pre-historic remains of its wood, but there exist no records of its introduction.

The Beech thrives best in a calcareous formation or a surface soil of rather poor, dry, sandy loam with a subsoil of chalk intermixed with small stones and gravel. Probably the finest Beech forests in the world are situated on the dunes of Denmark and Mecklenburg, and on the plains and low hills of Germany. In this country the largest trees are found at Dupplin Castle, in Perthshire, and at other Scottish seats, while the Chiltern Hills and adjoining counties abound with many noble specimens. Who has not heard of the famous Burnham Beeches?

Of late years the Beech has suffered much throughout every part of the country from the ravages of a minute parasitic insect named the Beech Coccus (*Cryptococcus fagi*). Though alarmingly on the increase it may be kept in bounds by an application of paraffin or petroleum emulsion, while scrubbing the affected parts with a brush and soft soap is to be recommended.

For shelter-giving purposes the Beech is valuable; while its supposed immunity from destruction by lightning has caused it to be planted as a shelter to farm stock in exposed situations. As a hedge



BRITISH GROWN TIMBER.



BEECH.

plant it is also valuable, being a rapid grower and forming an excellent fence. In rich soils it retains a great proportion of its leaves in a withered state during winter, and for this reason is additionally valuable for shelter; but it wants the rigidity of the thorn, and is not so effective as a farm fence. The timber is light brown in colour with a beautiful silky grain, hard, heavy and durable, especially when used indoors. It is extensively employed in the manufacture of numerous implements and in furniture making. It is the chief constituent in the making of Windsor and other chairs, and is largely employed for the handles of joiners', carpenters', and other wood-workers' tools, as well as for domestic utensils. For gun-stocks, saddle-trees, for heavy harness, planking for ships, wheel felloes, wedges, sieve rims, bobbins and toys it is greatly in demand. For butchers' blocks it is generally in use.

Some of the finest timber in this country is grown in conjunction with the Oak on the Chiltern Hills. Large numbers of cane-bottomed chairs are annually manufactured in this district. On account of its brittleness and liability to insect attacks, the timber of the Beech is seldom employed for building or constructional purposes, but for the banks of lakes or subaqueous structures, in which it is not exposed to the action of the atmosphere, the wood is of considerable value. It makes excellent fuel, and Beech charcoal is highly esteemed on account of the agreeable heat that it emits.

Propagation of the Beech, unless in the case of the varieties, is effected by seed-sowing in April.

The seeds, or mast, are collected when ripe in October and November and stored in dry sand till required for sowing in spring. As a guide to sowing, it may be stated that 2700 seeds are contained in a pound weight. Soil of a light, friable nature should be used for the seed beds, and thin sowing is to be recommended: the number of plants that may be expected from a bushel of seed being nearly ten thousand. It is well to remember that in a young state the Beech is easily affected by frost, so that seed-sowing should not be taken in hand before the time mentioned. Even after the young plants are six or more inches in height, it is well to protect the seed beds by placing a few evergreen branches over them during frosty weather in early spring.

In the case of the purple Beech, grafting is resorted to, which is also the method adopted in propagating most of the other varieties.

The Beech is a tree of rapid growth and attains its prime in from fifty to seventy-five years, but after that period the wood is apt to get black in colour and becomes subject to shake and rot. For timber purposes the more quickly the Beech is grown the better and the finer the graining. The timber should be removed from the woodland soon after being felled, as it is apt to get discoloured. In exposed situations the tree is stunted in growth, and being sparsely rooted is apt to get uprooted by the wind. It is subject to the attacks of many insect and fungoid pests, especially after full size has been attained. Beech timber varies greatly in price, from, say, 8*d.*, which is the ruling price throughout Wales, to

1s. 4d., or even above, per cubic foot in Southern England.

For Government purposes in connection with the war, Beech timber has been greatly in request of late, and from the Chiltern Hills heavy consignments of manufactured wood goods have been forwarded both to Home dépôts and to the Front. Tent-pegs, light Windsor chairs and saddle-trees are all uses to which this most accommodating of timbers has been put, while in connection with mine-sweeping it is found to be the most serviceable of home-grown woods. For purely economic purposes the Beech is one of our most valuable trees, and as it reproduces its kind freely from seed, advantage can be taken of an inexpensive method of reproducing Beech woods.

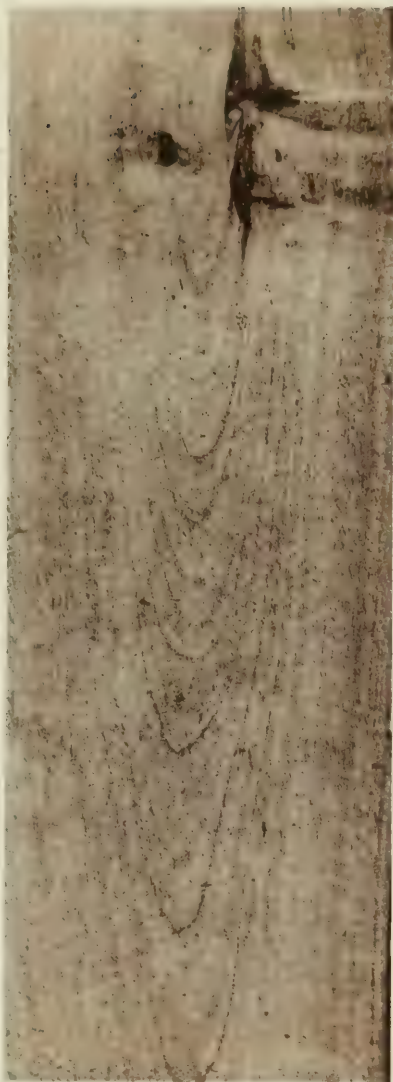
BIRCH

(*Betula alba*)

THIS native tree is to be met with all over Europe, while in Northern Asia and America it forms extensive forests. The size to which the common Birch attains varies with situation, being greatest on slopes and plains, while at high altitudes it becomes comparatively small and shrub-like. Usually the Birch attains a height of 50 feet, but under exceptionally favourable circumstances it may be found rising to 60 or 70 feet. In young trees the bark is of a reddish-brown colour, but with increasing age it becomes a beautiful silvery white, from which fact the popular name of Silver Birch has arisen. For cultivation in bleak situations and where the soil is poor gravel or shale rock, no tree equals the Birch.

The Birch is propagated by seed, which should be sown immediately it is collected; the power of germination not being retained after the first year. For naturalising on gravelly heaths and commons it is the most valuable of our native trees. The timber of the Birch is light, pliant, close-grained and tough, and almost white, or of a very light brown in colour, with the annual rings distinctly

BRITISH GROWN TIMBER.



BIRCH.



marked. It makes excellent firewood and charcoal for smelting purposes.

In conjunction with Alder the timber of the Birch is largely in use for the manufacture of clog-soles, and by coopers for pails; it is mainly employed for cheap furniture, butter kegs, for turnery purposes, for hoops and fish barrels. Chairs made from this timber are light and last for a long time. Birch-wood is also in use for hatters' blocks, thread bobbins, and for the manufacture of toys and brushes, and when of large size and good figure for veneers. The shoe-peg, generally considered the smallest commodity of timber, was at one time made from the wood of our native Birch, but this is now almost entirely superseded by that of the American Paper Birch, a tree that also thrives well in this country. No shoemaker whittles shoe-pegs now, the work being done by machinery from the cutting of the rotary veneer to the pointing of the pegs. Birch pit-props are largely made use of in Ireland. For building purposes it is neither sufficiently strong nor lasting, and may, amongst our home-grown woods, be ranked as third class. Large quantities of Birch branches are used by the broom-maker. The average selling price of Birch timber is 8*d.* per cubic foot, though in Wales we have frequently received 10*d.* per foot for clean trees of fifteen cubic feet and upwards.

BOX

(*Buxus sempervirens*)

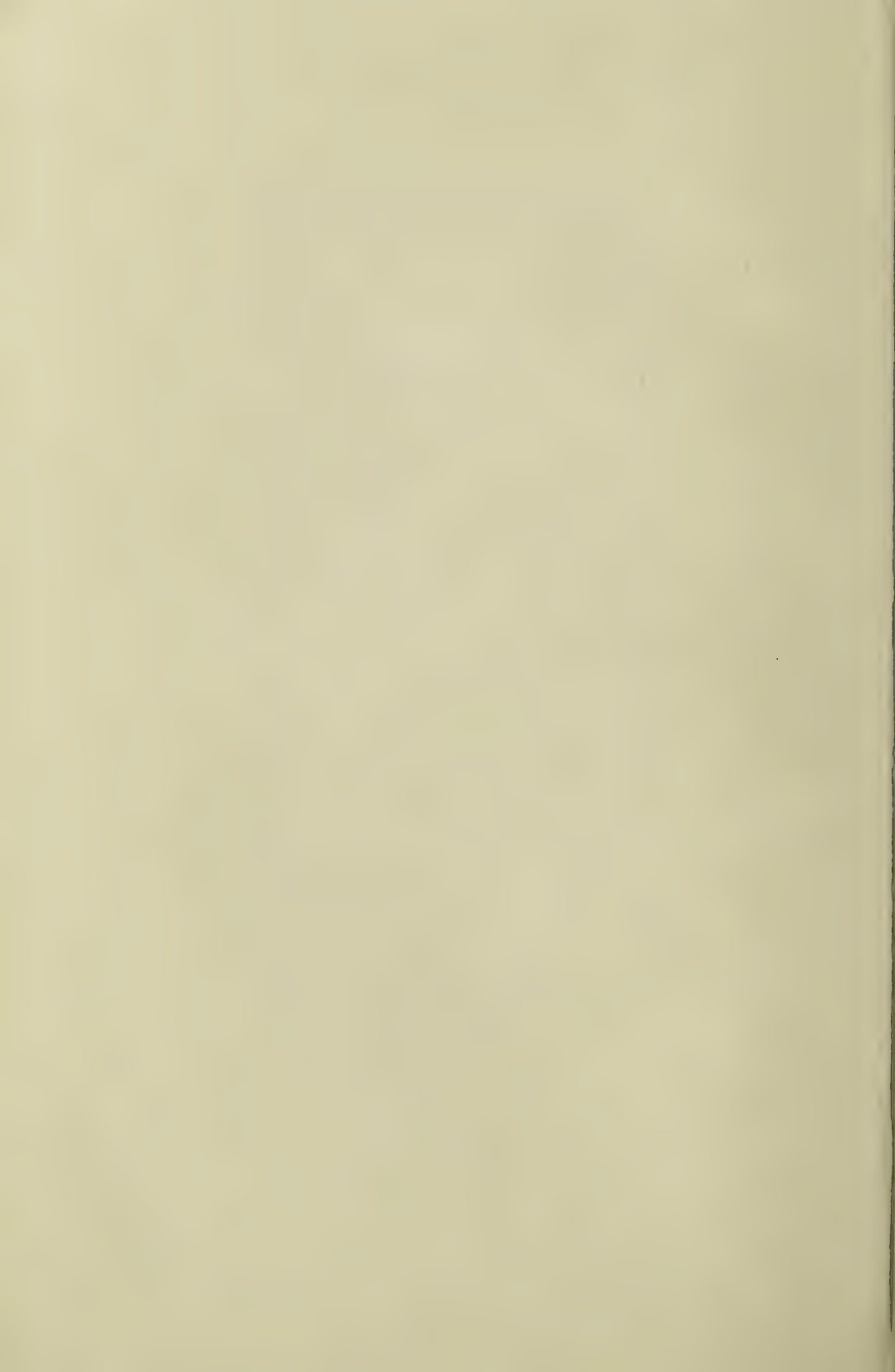
THE Box is not only indigenous to England, but has a somewhat restricted range in Southern Europe and Asia Minor. From the Black Sea forests and Caspian shores the finest Boxwood is exported. In this country the Box rarely exceeds 20 feet in height, though on the Continent specimens over 30 feet are not uncommon. The somewhat symmetrical habit of growth and dark shiny green leaves of the Box are too well known to require any description.

In this country the timber of the Box rarely attains to large dimensions, nor is it, except in a few instances, produced in sufficient quantity to be worth offering for sale. In Kent and Surrey, however, some small parcels of a ton and more have been marketed, and on one of Lord Derby's properties the price realised was about £5 per ton. Much higher prices have, however, been obtained. The wood is of a delicate and pleasing yellow colour, as every one knows who has examined a carpenter's rule, though it may be well to warn the reader that all foot-rules are not nowadays made of Boxwood. It is hard, dense and compact, and the heaviest of our home-grown timbers, and quite free from shake, with little or no pith.

BRITISH GROWN TIMBER.



BOX.



The timber of the Box cuts smoothly and evenly, neither splitting nor tearing, and every line is clearly defined and perfect. It is the best wood that has yet been discovered for wood-engravers' blocks, while in the making of mathematical instruments it is greatly in demand. It is also largely in use for thermometer scales, gauging rods, and wherever numerals or figures have to be cut on wood. Whistles, dice, buttons, spoons and snuff-boxes are all sometimes made of Box.

English Boxwood weighs fully 80 lb. to the cubic foot, and is quite equal in appearance and quality to that sent from abroad. Boxwood is now becoming scarce and the home supply meagre.

Though Boxhill, in Surrey, was at one time famous for the growth of Boxwood, the sales in 1815 having exceeded £10,000, yet much larger and equally valuable timber is grown on several private estates in southern England.

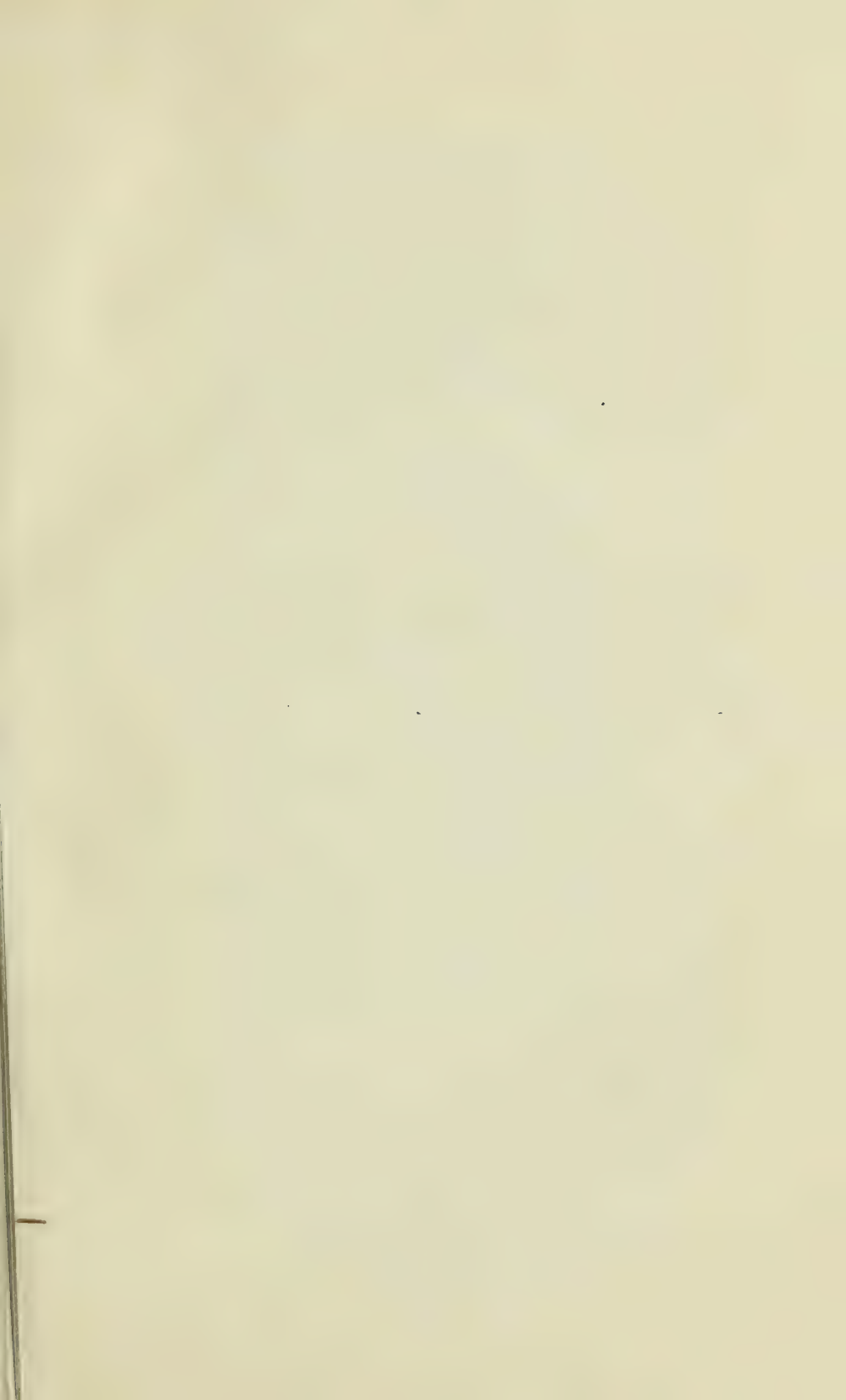
For shuttle-making Boxwood was at one time mainly used, but the falling off in supplies led a Liverpool firm to try several substitutes, the most successful being that of the Cornel and Persimmon.

BUCKTHORN

(*Hippophae rhamnoides*)

THE common Sea Buckthorn is one of the most valuable shrubs or small-growing trees for planting in exposed maritime situations and where the soil consists mainly of sand. There is, however, a much larger-growing tree in the, perhaps, lesser known Willow-leaved Buckthorn (*H. salicifolia*), which in Regent's Park and other places has attained to a height of 45 feet, and at Cambridge 47 feet. Several opportunities have been afforded of sampling the timber from trees that contained fully 20 cubic feet of wood and with stems fully 17 inches diameter. From the illustration it will be seen that the timber is of beautiful graining, while it is hard, elastic, smooth to work, and has given great satisfaction when used in the making of several household utensils and for the manufacture of toys and ornaments. It is of a remarkable colour, being a light yellowish-brown with distinct greyish veining. Unlike many woods it does not split or shrink in seasoning. (See Illustration, page 87.)

Though primarily a seaside tree, yet it is by no means exclusively so, and may be found attaining to large dimensions in several inland situations. We have not heard of the timber being sold alone, but equal quantities of this Buckthorn and Almond were bought by a London merchant at 2s. per cubic foot where felled.





CATALPA.

CATALPA

(*Catalpa bignonioides*)

THE Catalpa, or Indian Bean, though much prized as a timber-producing tree in its native country, is more valuable here for its ornamental character, particularly the large heart-shaped leaves, which usually have a bronzy appearance, and curiously marked flowers, these being white, tinged with violet and speckled with purple and yellow in the throat. It attains to a height of 30 or 40 feet in this country, and being well adapted for resisting the impurities of a town atmosphere, has been largely planted in London and other centres of industry.

The timber produced here is of excellent quality, and greatly resembles that of the Ash or Chestnut in graining. It is light for its bulk, close-grained, and working smoothly under the tools of the carpenter, has been found useful in the making of toys and small articles of ware.

Professor Sargent says that the Catalpa offers peculiar advantages for economic planting, the timber being of excellent quality and known to have stood as fence posts for seventy-five years and to be still perfectly sound. For railway trees it has also been found valuable. Several trees of the Catalpa have of late been sold in London, but in company with other home-grown woods, at 2s. per cubic foot, so that no definite value can be stated.

CEDAR OF LEBANON

(*Cedrus Libani*)

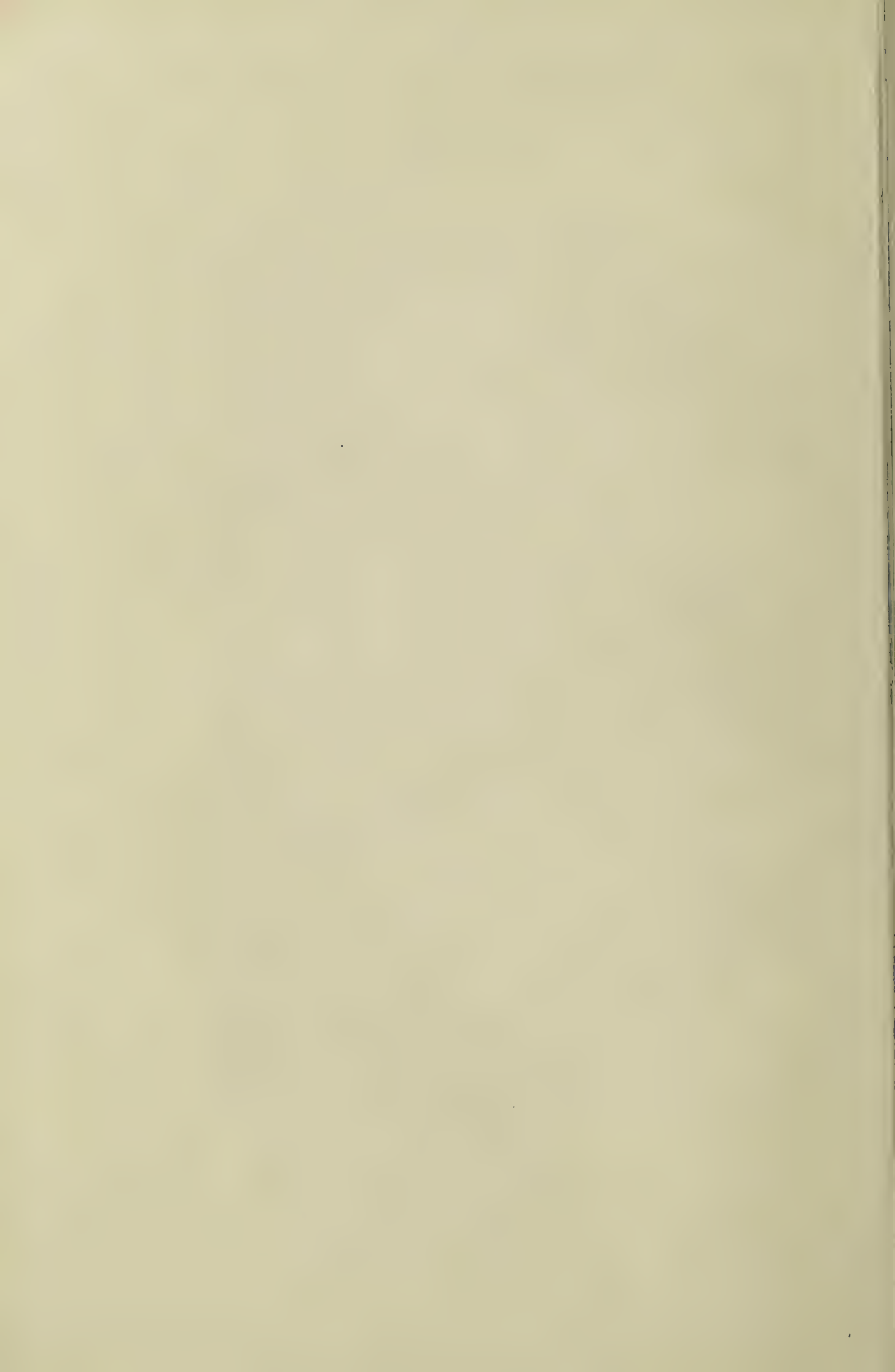
THE Cedar of Lebanon, which was introduced into this country about 1666, was evidently planted by many about that time, and to those early planters we are indebted for one of the most effective and ornamental of hardy evergreen trees. In this respect it is, perhaps, preferable to any other coniferous tree, further points in its favour being its hardy, vigorous constitution and adaptability to a great variety of soils and situations.

Few objections can be raised against the Lebanon Cedar as an ornamental or timber-producing tree in this country, the only one worth consideration, perhaps being that when the heavy limbs get straggling far from the main stem, they are apt to snap across during stormy weather, and in this way some of the largest and oldest trees have been much disfigured. It is a tree of rapid growth when suitably placed, and specimens in Kent have been known to produce at the rate of $1\frac{3}{4}$ cubic feet of timber per year for a century. Two trees, with the timber of which we carried out numerous experiments as to lasting qualities, had been planted for 99 years and 130 years. The former produced 153 and the latter 231 cubic feet of timber. The timber produced in this country is of a pleasing reddish-white colour,

BRITISH GROWN TIMBER.



CEDAR OF LEBANON.



brittle though long-grained, light, easily worked, and susceptible of a good polish. It is certainly apt to snap short, but for all that it has good, lasting qualities as the following will show.

A trough for washing sheep was made of this wood by the writer, and after being eighteen years in use and subjected to drought and damp alternately, for it was sunk in the soil, it was found to be perfectly sound when removed. The tree from which the boards were cut was close upon a century old, having been planted by the great statesman William Pitt, when he owned the Holwood Estate in Kent, now in the possession of Lord Derby. The boards were fully 2 inches thick and of various widths up to 2 feet, the trough being 12 feet long and 4 feet wide. The position in which the timber was placed was one of the most trying, for being sunk in the soil and only filled with water during the sheep-shearing season, the vicissitudes of drought and damp were very considerable and well-fitted to test the lasting properties of wood. The timber of unusually large specimens that had been uprooted at Woburn Abbey and other places gave good results when used for general estate purposes. It is interesting to note that the oldest Egyptian coffins still in existence were made of the wood of Cedar of Lebanon and Oriental Sycamore. In *My Garden*, Mr. Smee relates the following regarding Cedar-wood:—

“The wood of the Cedar contains a volatile essential oil, which has the curious property of unsettling printers’ ink and making it run. Some years ago a Bank of England note was offered to

the cashier with its printing disturbed. Inquiry was set on foot, and it was traced to several individuals who satisfactorily explained its custody and possession. It was then brought to me, when I suggested that the detectives should inquire whether it had been kept in a Cedar box; it was then discovered that the last possessor had kept it in a new Cedar box, which she had recently bought, and thus the mystery was solved."

At Penrhyn Castle, in Wales, a quantity of bacon was rendered unfit for use after being smoked by wood of the Lebanon Cedar.

There being no fixed market for Cedar-wood, the price is difficult to record, but in regard to the many trees of this kind that we have sold it might be candidly stated that demand for these was not encouraging, and the price obtained similar to that of Scotch Pine timber—namely, from 6*d.* to 8*d.* per cubic foot.

Regarding the value of timber of the Lebanon Cedar it is recorded in the *Memoirs of the Chelsea Botanic Gardens* that of two trees that were cut down in the year 1771, the contents of the trunks were 133 $\frac{3}{4}$ feet, valued at 2*s.* 8*d.* per foot, the boughs containing 84 $\frac{3}{4}$ feet at 1*s.* 4*d.* per foot, the total value of the two trees being £23 9*s.* 8*d.* The Lebanon Cedar having been introduced to this country about 1666, it is evident that the Chelsea trees must have been amongst the first of those planted, but even then the amount of timber produced and the price realised were remarkable a century and a half ago.

CHERRY

(*Prunus* or *Cerasus vulgaris*)

THE Gean, or Wild Cherry, as an ornamental as well as a valuable timber-producing tree, is too little known in this country. Many points might be adduced in its favour, such as immunity from disease, rapidity of growth when planted in suitable soil, the closeness with which it can be advantageously planted, and last, but by no means least, the value of the timber obtained.

As an ornamental tree of small growth, the Wild Cherry takes high rank, for during early summer when laden with pure white flowers, or again in autumn, when the plentiful shining black fruit hangs in clusters from the branches, it will be readily admitted that few of our woodland trees have a more beautiful or conspicuous appearance. In thinning a plantation on the banks of the Ogwen River, in North Wales, many trees of the Wild Cherry were found on measurement to be 70 feet high, with stems fully 2 feet in diameter at breast-high. The timber of these trees was found to be of excellent quality and remarkable for the large size of its medullary process, which gave the longitudinal section a bright satiny lustre, and rendered it well suited for ornamental cabinet work.

Nearly allied to the Gean is the Bird Cherry (*Prunus Padus*), which occurs in fair numbers in various parts of Britain, notably the North of Scotland, where in the woods at Darnaway specimens 40 feet high are not uncommon. On the Welsh hillsides, growing amongst other trees, the Bird Cherry has attained a height of fully 30 feet, and at Halston, near Oswestry, there is quite a forest of the Bird Cherry. The Wild Cherry reaches its full size in about seventy years, and would appear to succeed best in rocky situations, and where loamy soil on an open bottom is provided. The largest trees in this country are, however, found growing on alluvial deposit or shale rock, and in a lowland situation.

Though slightly varying in colour with age, the wood is of a light mahogany tint, inclined to red, firm and remarkably close in the graining, easily worked and susceptible of a nice polish. As regards the value of the timber of the Gean, or Wild Cherry, this is rarely produced in sufficient quantity to be offered alone, but we have frequently sold it at from 1s. to 1s. 4d. per cubic foot where felled, and in conjunction with other woods for turnery purposes. A considerable number of the trees were on another occasion disposed of at 10d. per foot along with Alderwood and Birch for clog-making.

Cherry timber is also found useful in fancy cabinet-making and for turnery purposes generally. Cherry pipes and cigarette-holders are in request by smokers on account of the pleasant flavour they impart to the tobacco.

BRITISH GROWN TIMBER.



CHERRY.



The timber of the cultivated Cherry is held in esteem by turners in the London district, and probably the largest trees of this kind are to be found in the fruit-growing districts of Bucks, where we have measured trees containing fully 30 cubic feet of prime timber. For special purposes some of these logs have been sold at a much higher price than that quoted for the timber of the Wild Cherry.

From the fruit-growing districts of southern England quantities of the wood of the cultivated Cherry tree are annually disposed of, and some 50 cubic feet of specially clean, cultivated Cherry sold at 3s. 6d. per foot in the Metropolitan area last winter.

CHESTNUT (HORSE)

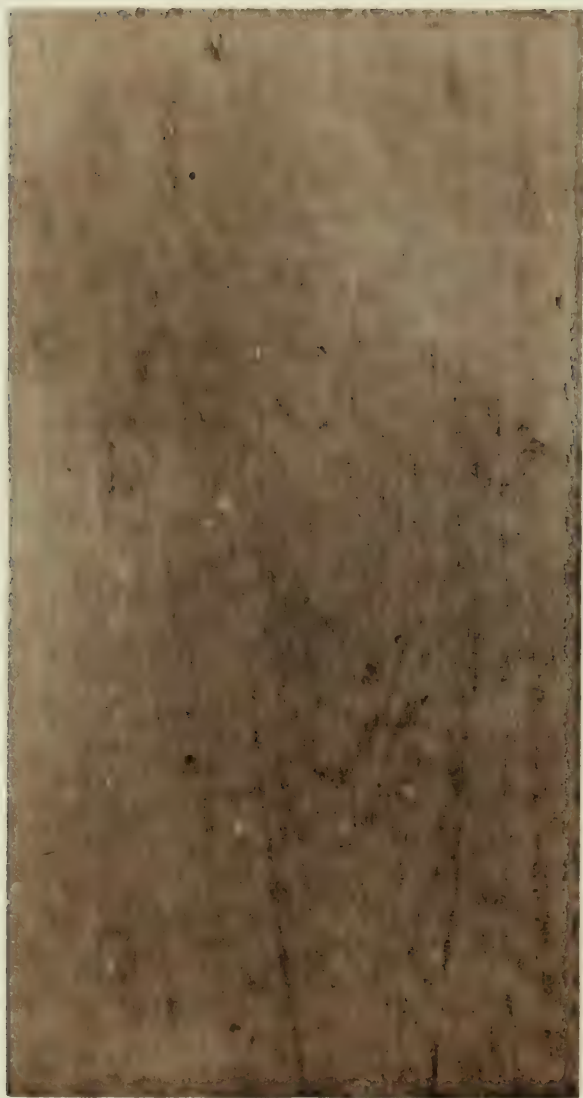
(*Æsculus Hippocastanum*)

THE Horse Chestnut, the pride and glory of most English Parks, was introduced into this country in the reign of Queen Elizabeth by Tradescant, who cultivated it in his famous Botanic Garden at Chelsea.

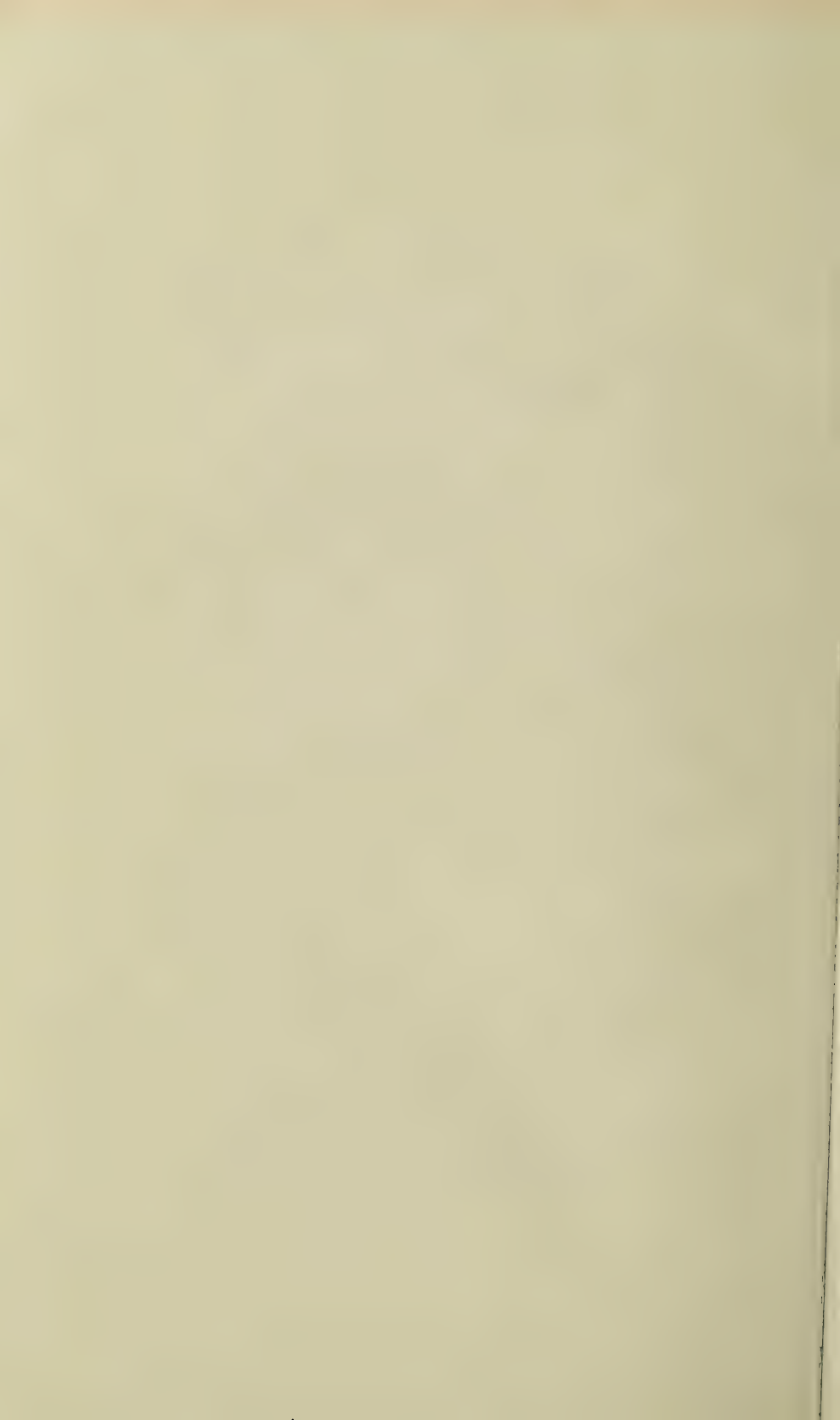
As an ornamental tree it has, perhaps, no equal, the exquisite symmetry and beauty of both foliage and flower rendering it peculiarly suitable for landscape effect. Unfortunately, the tender, massive foliage is easily injured by frost, and the wood, being soft and brittle, is readily broken over, thus rendering the tree unsuitable for high-lying or exposed situations. It is a tree that should not, on account of its brittle wood, be planted in proximity to buildings.

The timber of the Horse Chestnut, though of no special value for constructive purposes, is, on account of its lightness, largely in use for the manufacture of packing-cases, for moulding patterns for castings, for turnery purposes, cheap boarding, and for the making of brush backs and cutting boards. The price varies according to district, but 8*d.* per foot may be accepted as the average, and the demand, even at a lower figure, is not great. The timber when matured is of a pleasing yellowish colour, soft, and easily worked.

BRITISH GROWN TIMBER.



HORSE CHESTNUT.



CHESTNUT (SWEET, OR SPANISH)

(*Castanea vesca*)

THE Sweet, or Spanish, Chestnut is an introduced tree, and though the exact date of its introduction is not known there is every probability that it was brought to this country by the Romans. From Sardis, in Asia Minor, it was brought to Europe by the Greeks about 504 B.C. The scientific name (*Castanea*) is derived from Kastanea, a city in Pontus, in Asia, where the Chestnut grew in abundance, and, as the Greek name was used by the Romans, it points to the probability that the tree was received by them from the Greeks. Around London there are numerous examples of aged Chestnuts, such as at Cobham in Kent, at Cowdray in Sussex, and those growing in the park at Greenwich. Some are of the opinion that the old tree at Tortworth is coeval with the Roman period in this country.

When it has arrived at full maturity the Spanish Chestnut is a noble and magnificent tree, quite equal in the opinion of many to the Oak in appearance, the beautifully serrated, dark green leaves and abundant creamy-white flowers imparting an aspect to the tree that is quite its own. The foliage, too, is rarely attacked by insect pests, and remains on the trees till late in the autumn.

Like the Beech, the Sweet Chestnut has its preferences as to soil, and succeeds best in a deep sandy or gravelly loam, as at Woburn Sands in Bedfordshire, and in deep gravelly soils, as in the Park at Greenwich. On clayey soils or those of a stiff, tenacious character, the Chestnut will not succeed. It is a lowland tree, preferring sheltered valleys to upland situations, at least in this country. On granite or sandstone formations and with a western aspect it also does well, but rarely succeeds on chalk or limestone. Amongst rocks where soil is scant it also grows freely.

For timber-producing the Chestnut is a valuable tree, while for coppice purposes it is not greatly excelled by the Ash. As a fruit tree the Chestnut in this country is of no great value, though in Southern England heavy crops of chestnuts are borne during certain seasons, which, as far as quality and size are concerned, are quite equal to those from its native countries. Unlike the timber of the Oak, that of the Chestnut does not increase in value as it advances in age, but should be cut down when from fifty to one hundred years old. After that period the wood usually becomes affected by "shake," and gradually decreases in value for constructive purposes. The timber of the Sweet Chestnut would appear to be at its prime when about fifty years old, at which age it is invaluable for fencing purposes, as it rends readily and lasts well, as is evidenced by some of the deer fences in the old park at Woburn.

For furniture-making Chestnut is much in request ;



SPANISH CHESTNUT.

when stained it is largely substituted for Walnut and when of plain figure for Oak wainscotting. Much of the so-called Oak fencing used in and around London is made of Chestnut, and the deception is easily practised as the woods are much alike.

The timber of home-grown Spanish Chestnut is light brown in colour, clean and close of grain, lighter than Oak, the medullary rays being scarcely visible. It is susceptible of a nice polish and readily worked. It has frequently been mistaken for Oak timber, the difference, especially when worked up, being in some cases difficult to detect.

For long it has been a disputed point whether the timber of the roof of Westminster Hall is Oak or Chestnut. Originally, the wood was described as Irish Oak, but about the end of the thirteenth century, when extensive structural alterations and repairs were undertaken, it was stated to be of Spanish Chestnut. This caused great confusion and gave rise to a considerable amount of controversial correspondence, some writers describing the roof as of Oak, while others affirmed that it was Chestnut.

Here it may be well to state that the roof has had a rather chequered career, it being originally erected in 1098, pulled down and rebuilt in 1397, and thoroughly repaired on several occasions at later dates. That a quantity of Chestnut timber was used in connection with certain of the buildings at Westminster is well known, and this, no doubt, has given rise to the erroneous statement that the

roof of the famous Hall is also of that wood. In order, if possible, to settle this vexed question a thorough examination of the roof was made by the writer during the repairs recently carried out, with the result that all the timber was found to be of Oak. Not only was the timber of the roof examined *in situ*, but portions of the decaying wood, which it was found necessary to remove during repairs, were subjected to a careful scrutiny and comparison with other timber of a similar kind, this leaving no doubt as to the particular wood of which the roof was reconstructed.

To those who are unacquainted with the botany of timber it may be stated that Oak and Chestnut can be readily distinguished by the peculiarities of their medullary rays, which are lines radiating from the centre to the circumference and presenting a star-like appearance. To the carpenter these lines are known as felt or silver grain, but to the botanist as medullary rays. In Oak there are two sizes of medullary rays, a few being broad and many very narrow, all, however, being distinctly visible. Chestnut, on the other hand, is readily distinguished by having no broad rays, while the narrow can only be detected by means of a magnifying glass. In the actual specimens themselves, and even in photographs of them, in the case of Oak from the roof of Westminster Hall, brown Oak from Welbeck Abbey, and old Spanish Chestnut from Greenwich Park, the peculiarities of graining in the different woods are readily detected, and leave no doubt that the roof of the Hall was constructed of

prime British Oak. The photographs of the Oak show distinctly the medullary rays in that timber, while in those of the Chestnut not a trace of these rays can be detected.

At one period of the history of our country, Chestnut timber stood in high favour, and was, indeed, preferred to that of Oak, being largely used in the flooring and roofing of buildings. In many cases, however, Oak and not Chestnut was employed, owing to the similarity in graining of these two woods. That, under certain conditions, Chestnut timber can survive that of Oak is well known.

The present demand for the timber of the Spanish Chestnut is not very great and prices vary considerably with locality and demand. We have sold quantities at prices which ranged never lower than 10*d.*, or higher than 1*s.* 4*d.*, per cubic foot.

CORNELIAN CHERRY

(*Cornus Mas*)

THIS is one of our earliest flowering trees, the bright yellow clusters of bloom being produced by the middle of February and before the leaves have appeared. It is a tree of small growth, rarely exceeding a height of 25 feet, with a stem up to a foot in diameter. Succeeding well in this country under what we might consider as somewhat unfavourable conditions, both as to soil and site, the Cornelian Cherry has been extensively cultivated for its free growth and ornamental appearance.

The timber, though small in size, is remarkable for its density, and beautiful graining and the silky polish to which it lends itself, taking a surface that almost equals that of Boxwood. It is very hard, heavy, close grained, and of a slightly yellowish tint. For durability, old seasoned timber is justly valued and turned to many useful purposes in the small ware line.

We have not heard of the timber of the home-grown Cornelian Cherry being sold except in company with that of other trees, so that to state a price is impossible. Its value should be about equal to that of Holly, to which it bears some resemblance.

BRITISH GROWN TIMBER.



COTONEASTER.

COTONEASTER FRIGIDA

INTRODUCED from Nepaul in 1824, this is the largest growing tree of the family, reaching under favourable circumstances a height of 25 feet. From an ornamental point of view it is well known, the large bunches of glowing red fruit being plentifully produced on fair-sized specimens. Birds, unfortunately, are extremely fond of the fruit, and so, with the least touch of cold or frosty weather, the trees quickly get stripped.

Experiments made with the timber prove that it will be valuable for the making of golf-clubs, and already both in England and Scotland it has been used for this purpose. It is extremely hard, close and cross-grained, difficult to split or splinter and can be finished off with a clean smooth face. Trees in the Flower Gardens at Regent's Park and elsewhere are fully 25 feet high, with stems 10 to 12 inches in diameter at the height of a man. For cold exposed sites on clay soil, and as a town tree where it withstands smoke well, *Cotoneaster frigida* has been found most useful.

Regarding the value of the timber we are not prepared to commit ourselves, but should present experiments turn out as they shape, the price realised should be equal to that of Apple, Cherry or Yew.

DOUGLAS FIR

(*Pseudo-tsuga Douglasii*)

WHETHER planted singly or in clumps, this tree is highly effective, the giant proportions, easy and graceful outline and thickly foliated branches of the deepest and richest green being special points of attraction.

Along the margins of plantations it forms a striking contrast to other trees of a lighter and more airy appearance. The Douglas Fir, named in honour of the celebrated Scotch botanist and plant collector, was introduced in 1827, since which date it has been largely planted all over the country, not only for ornamental purposes, but because it is a rapid producer of fairly valuable timber. The famous flag-staff at Kew is of this timber and replaces one of the same kind that was erected in 1861.

Although perfectly hardy in almost every part of the country, yet the Douglas Fir cannot stand exposure to hard-blowing winds, the leading shoot and upper branches suffering much either from breakage or denudation of foliage. This is mostly the case when the tree is grown with others in a plantation, the leader, when it has overtopped the surrounding trees, being apt to get broken over by the wind.

The timber produced in this country is hard,

durable, and when matured, of a colour almost as rich as Yew and susceptible of a nice polish. The production of timber goes on at a rapid rate in this country, the Douglas Fir being, perhaps, surpassed by no other tree in this respect, fully 5 cubic feet per year having been produced over a period of half a century. The timber, too, is of good quality, and the results of numerous trials, both in and out of doors, with that of home growth have been quite satisfactory, and lead us to believe that when fully matured it will be found useful for many purposes to which at present foreign-grown timber is applied.

When young, the timber is soft and liable to insect attacks and sudden decay; when older, it is of an agreeable yellow colour, hard, firm and somewhat difficult to work. It gets much darker with age and more brittle. We have used the timber of home growth from trees which contained 150 cubic feet and upwards, for many estate purposes, including fencing, boarding for sheds, packing-cases and boat masts, and the results have given satisfaction.

The price of homegrown wood of the Douglas Fir varies with the district in which it is offered for sale, but about 10*d.* per foot was obtained for a large lot of fifty-year old trees a year ago. Being obtainable in large widths, boarding of the Douglas Fir can be used very economically for the making of packing-cases where wide planking is an advantage.

ELDER

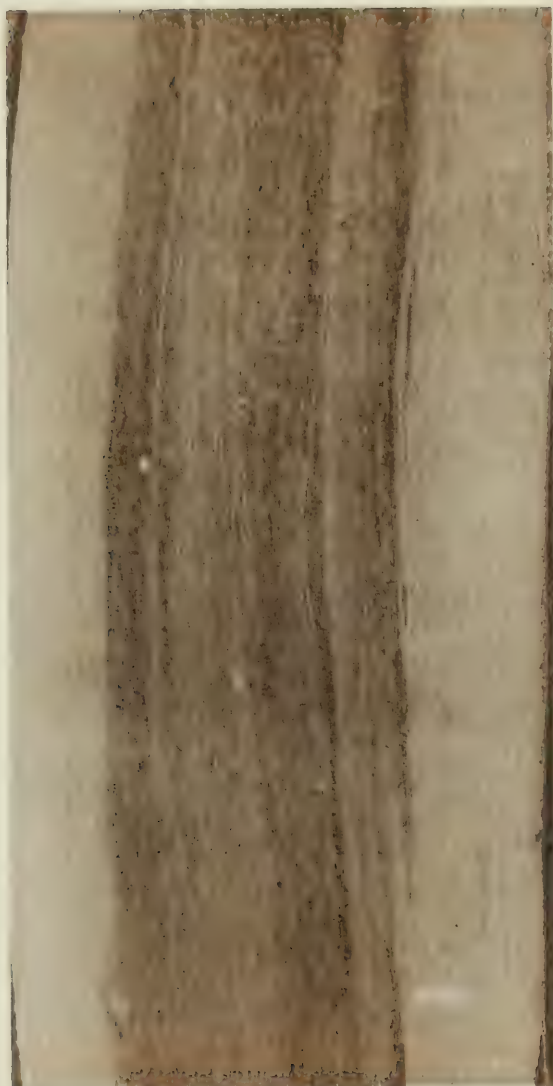
(*Sambucus nigra*)

THE Elder is the hardiest of our native trees; succeeding alike on the exposed sea-coast or on high-lying ground, where the force of the wind compels almost every other form of tree-life to become stunted and unsightly. Again, for planting in a heated town or where the atmosphere is impregnated with the emanations from iron and chemical works it has, perhaps, no equal.

No other tree will grow in the shade and withstand the drip from taller growing species as will the Elder, and for boundary fences in upland situations where nothing else will grow it is our most valuable shrub. As an ornamental subject it is rarely planted, though the golden and silver-leaved varieties are widely distributed.

The timber of the Elder, which is white, close-grained and very compact, is valuable in many ways, and when of fairly large size, say, up to 4 or 5 inches square, it is much sought after for printing-blocks and the inlaying of furniture. It can be readily tinted in imitation of box or ebony. Being limited in quantity and rarely offered for sale the market for Elderwood is irregular, but 40s. per ton has been accepted for that of 4 inches in diameter and upwards.

BRITISH GROWN TIMBER.



ELDER.

ELM (ENGLISH)

(*Ulmus campestris*)

AMONGST several species and varieties of Elm that are cultivated in this country, our remarks refer particularly to the small-leaved Elm of England and the broad-leaved or Wych Elm of Scotland.

The English Elm, which is a common hedgerow and avenue tree throughout the southern counties when allowed to grow and spread in a natural way, is lofty and graceful in growth, while the timber it produces is probably sought after for a greater number of uses than that of any other species. When suitably placed, it is a tree of rapid growth, of rather upright habit, with a tall, well-built stem. Though by no means particular as to soil this Elm flourishes best on that of a deep, loamy description and in a dampish, not wet situation. It is the first tree to salute the early spring with its abundantly produced light green foliage, and amongst the first to lose its leaves in the autumn. The pinky-brown flowers, which appear in early spring before the leaves, impart to this tree a decidedly warm and cheerful appearance. From the Wych, or Mountain, Elm it is readily distinguished by the smaller and doubly serrated leaves. It rarely produces seed in this country, but sends out suckers

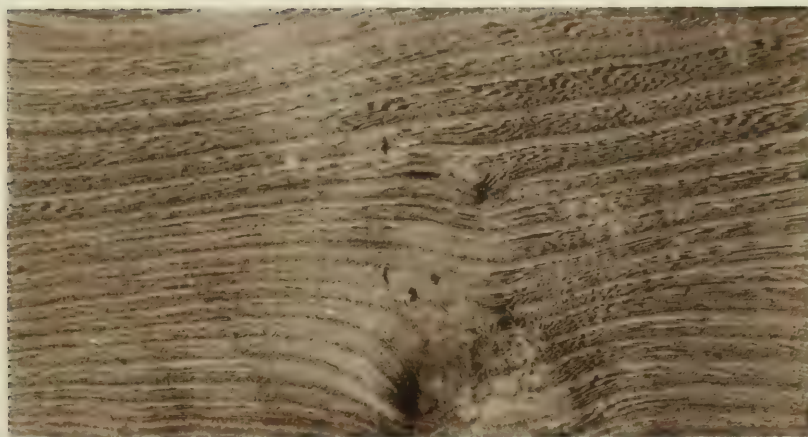
in abundance, the contrary being the case with the Wych species.

The English Elm attains maturity in from sixty to seventy years; after this age it usually becomes diseased and hollow-stemmed. It is, perhaps, more than any other tree, liable to be broken over or uprooted during stormy weather. The timber in matured specimens is of a rich, dark brown colour, tough and usually with a twisted grain. It is difficult to split, and, when cross-grained, hard to work under the tools of the carpenter. When fresh felled it emits a peculiarly unpleasant smell.

Probably Elm-wood is used for a greater variety of purposes than any other timber grown in this country; indeed, so numerous are the uses to which it is applied that they would be by no means easy to enumerate. Both the wheelwright and cabinet-maker make extensive use of Elm-wood; for the naves of wheels it is largely in use, bearing better than any other timber the trying ordeal of driving the spokes into the nave, which is rarely more than twelve inches in diameter. For carts, wheelbarrows, pumps, packing-cases and as a substitute for Ash in the making of agricultural implements, Elmwood is largely employed, while for coffins the annual consumption is considerable. In engineering works it is also largely employed, and by the boatbuilder for planking under water.

When totally immersed in water, or kept constantly beneath the ground, the durability of Elmwood is hard to estimate. Not long ago, we had the privilege of examining some of the wooden

BRITISH GROWN TIMBER.



ENGLISH ELM.



WYCH ELM.



water-pipes that were being removed from a London street where they had been laid for nearly a century and a half. These Elm trunks were about 6 feet long and varied from 8 to 18 inches in diameter. They were bored longitudinally with holes that varied in diameter from 7 to 10 inches. The pipes showed not the least indication of decay, indeed, if anything, the timber seemed harder and firmer than that of fresh-felled trees.

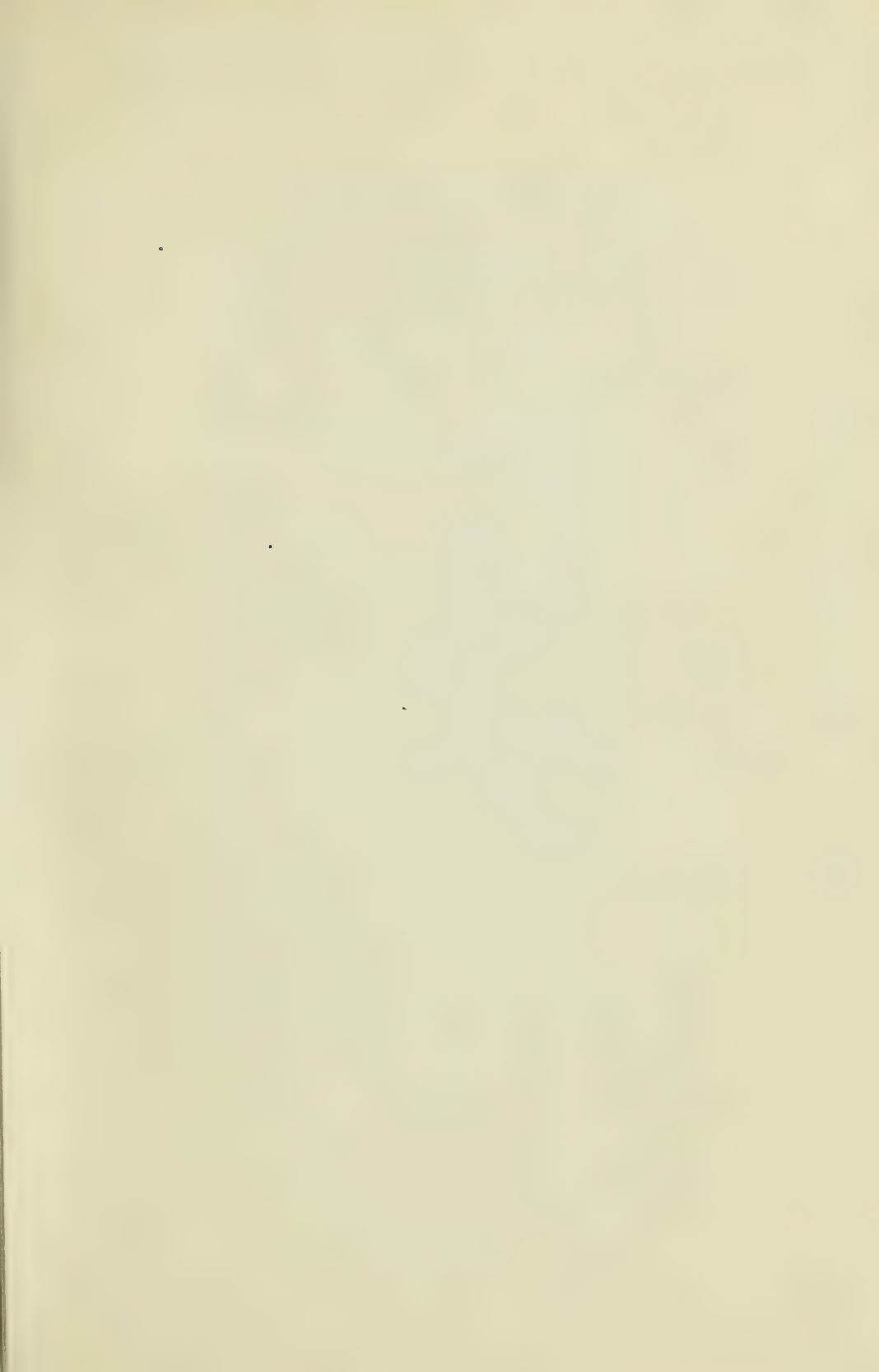
The price of Elm timber varies greatly with the district in which it is sold and, of course, with the age and quality of the wood and convenience for removal. Around London, the average selling price may be put down at 10*d.* per cubic foot, though for special lots 1*s.* 2*d.* and upwards was paid during the past season. Plenty of rough hedgerow and field-grown Elm timber can be bought at a much cheaper rate.

ELM (WYCH, OR SCOTCH)

(*Ulmus montana*)

THIS tree is easily distinguished from the English Elm by its shorter bole, smoother and thinner bark, more spreading habit and larger leaves. It produces seed in abundance, but rarely sends out suckers from the root.

For certain purposes, the timber of this tree is supposed to be more valuable than that of the English Elm, but usually they are very much alike and realise similar prices on the market. It is of a light brown colour, and of finer and straighter grain and more pliable than the English species. Generally speaking the Wych Elm is less common than the English, and the timber is considered to be more valuable for wheel naves and felloes. In bent work and turnery it is often applied. For special purposes the wood of the Wych Elm will command a higher price than that of the English species. The Dutch Elm and many others are cultivated in this country, but they are in no way superior as timber-producers to the above, with the exception of the Cornish Elm, the wood of which is remarkably tough and preferred by wheelwrights when obtainable. It was at one time largely used for making boxes in which China clay and cement were imported. The price of Wych Elm timber varies from about 10*d.* to 1*s.* 2*d.* per cubic foot.



BRITISH GROWN TIMBER.



THORN.

HAWTHORN

(*Crataegus oxyacantha*)

THE Thorn, Hawthorn or Whitethorn, for it is well known by all of these names, is one of the most valuable and useful of our native small-growing trees. As a hedge plant it has no equal, the timber makes excellent firewood, and when of large size can be utilised in the manufacture of many important household and other items.

As an ornamental tree of medium growth, the Hawthorn, particularly in its varieties, is widely appreciated, there being few homesteads in our country where it is not employed. The flowers, which are usually produced in abundance, appear in May, and this circumstance accounts for its popular name of May or May Blossom by which it is so widely known. Though slow in growth, the tree lives to an old age and produces timber that is exceedingly hard and durable. It is tough and close-grained, cream-coloured and with a beautiful wavy graining. Being a somewhat shy rooter, large specimens of the Hawthorn are often either bent over or totally uprooted by the blast. The timber is usually associated with that of the Pear and Apple and is used for similar purposes.

The price varies with the district and the local

demand. Several tons that were lately cut down on an estate near London realised £3 per ton when felled. For special logs, wanted for special purposes, special prices have been obtained, and 2s. 6d. per foot was the selling price of half-a-dozen such trees in the London market twelve months ago. During last summer 4s. per foot cube was paid for some nice, clean Hawthorn stems placed on rail for London.

HAZEL

(*Corylus avellana*)

FOR coppice planting the Hazel is one of our most valuable small-growing trees, the wood being readily bent, remarkably tough and long-grained, and obtainable in straight, clean wands.

For walking-sticks, crate-making and hoops for fish and other barrels, as well as for stakes of all kinds, Hazel has few equals, and is only superseded by the Ash in general all-round usefulness and value. The timber is rarely obtained of sufficient size to work under the tools of the carpenter, for the tree seldom rises higher than 25 feet, nor produces a stem over 9 inches in diameter. It is of a reddish colour, not unlike mahogany, but much lighter and less compact. Its uses in the round state are, however, almost innumerable, and for garden purposes alone Hazel stakes of many kinds and sizes are commonly in use. Its value as underwood is considerable, and in conjunction with Ash and Chestnut, usually realises from £5 upwards per acre when from twelve to fourteen years old.

Extensive use is made of Hazel poles in the pottery districts and on fishing stations, particularly along the east coast. The filbert is only a variety of the Hazel.

HOLLY

(*Ilex aquifolium*)

WHETHER as a hedge plant or specimen tree, no evergreen is more valuable than the common Holly. It is beautiful at all seasons, bears pruning with impunity, and makes a highly ornamental and impenetrable fence. Again, as a shelter plant or for use in shady positions it has no equal, while as a berry-bearing tree its extensive use during the festive season renders it one of the most useful and valuable for decorative purposes.

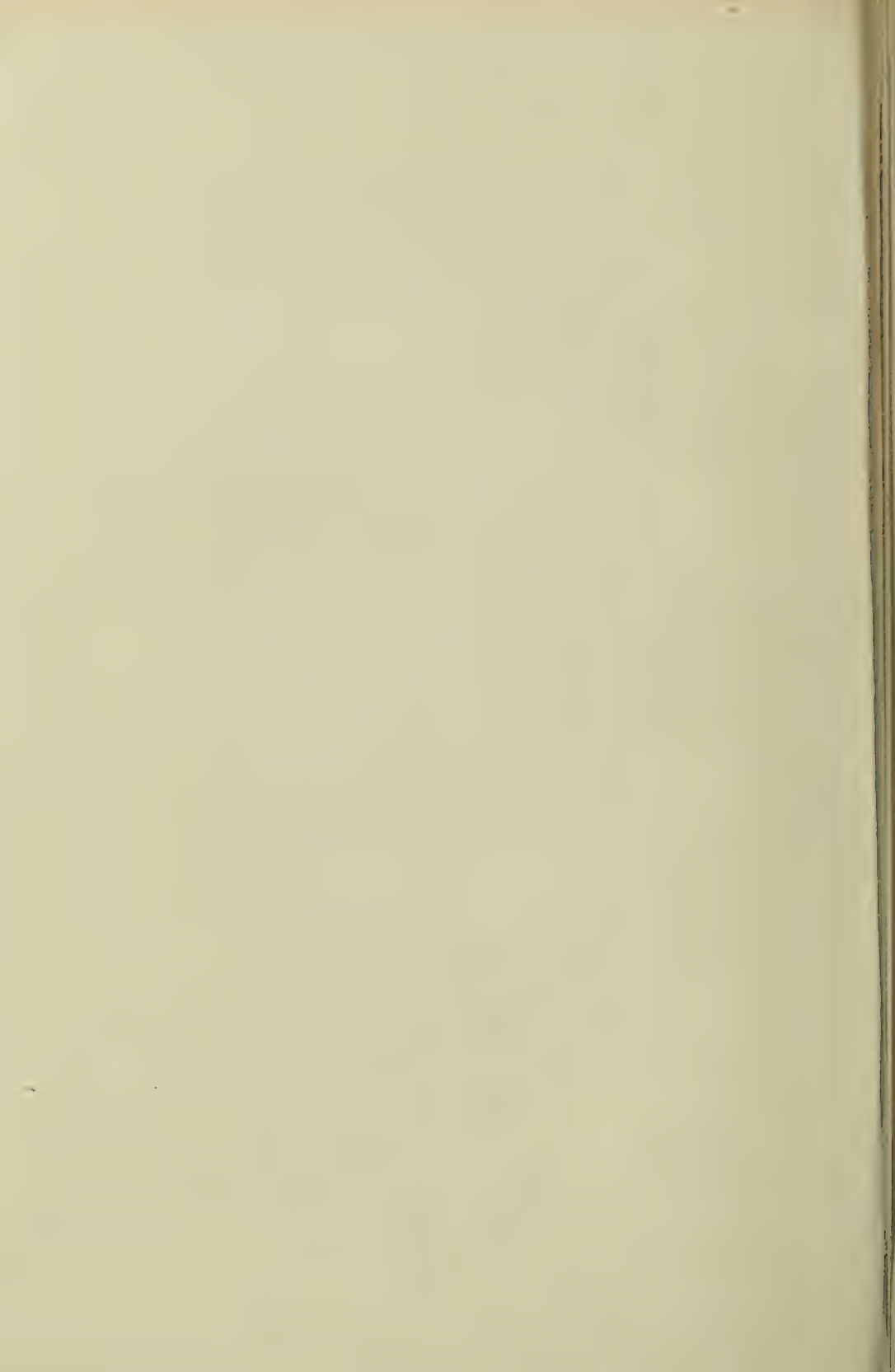
The name Holly is a comparatively modern one for the Holme, Hulver and Hulferl. It was also known as the Scarlet Oak. Holly is a corruption of "holy" tree on account of its use in the decoration of churches at Christmas.

The common green Holly of the British Isles and Southern and Western Europe is botanically known as *Ilex aquifolium* and bears no relation to the *Ilex* of Latin and other writers, which is an evergreen Oak *Quercus Ilex* belonging to an entirely different genus. The Holly is a tree of great longevity, and succeeds best in a sandy or gravelly soil, where plenty of humidity is present in the atmosphere. It is usually an erect and many-branched tree of from 40 to 50 feet in height when favourably situated, though rarely exceeding 25 feet

BRITISH GROWN TIMBER.



HOLLY.



in the woods, where it is indigenous. Though variations occur, the Holly may be described as diœcious, and it is an interesting fact that the predominant sex of the tree is often determined by its age; this is the reason why old trees bear fruit in the largest quantity.

Until it has become thoroughly established the Holly is a tree of slow growth, but much depends on soil and situation. It is usually considered as a difficult shrub to transplant, but if well prepared whilst under nursery management and shifted at the proper season, there is little to fear in this respect. The best time to safely remove the Holly is the first week in April, or just as it is bursting into bud, since there is then a reciprocal action below which enables it to start into growth at once before shrinkage of the bark occurs.

For planting in smoky localities the best variety is *Hodgin's*; for the sea-coast that named *Scotia* has been found the best; while for berry-bearing, *Balearica*, *Glabra*, *Maderiensis*, *Flava*, and the yellow-fruited *Lutea*, have no equals. Of the variegated kinds those named *Argentea marginata*, *Golden Queen*, *Silver Queen*, *Milkmaid* and *Water-eriana* are the most desirable.

The wood of the Holly, though rarely obtained in marketable quantity, is of considerable value in the making of mathematical instruments. It is also in request for fancy turnery and inlaid work, and is sometimes sold as ebony when "ebonised." It is of a yellowish colour, of fine grain, takes a good polish and works well under the tools of the

carpenter. Except when thoroughly seasoned the wood is apt to warp and crack, and to avoid this, we have found it a good plan to allow the timber to remain in the log, uncut, and in a shady position for two years before being worked up. Holly timber, used experimentally out of doors, shows no change in thirty years. The bark, after boiling, bruising and fermentation, forms a substance known as bird-lime. The value of Holly timber is about 2s. 6d. per cubic foot, though it is often sold in lots at an equivalent of from £4 to £5 per ton, and two tons were lately delivered in London at 5s. per cubic foot.

As is well known, berried Holly is extensively used for Christmas decoration, many tons being sent each year to Covent Garden and other of our London markets, and retailed in the streets at a few pence per bunch during the festive season.

During the late storms many large Holly trees were uprooted on an estate near London, some of the individual specimens that we measured containing over 30 cubic feet of timber. For this a ready market was obtained at quite a remunerative price.

Timber merchants quote 5s. per cubic foot for seasoned Holly delivered on rail.

BRITISH GROWN TIMBER.



HORNBEAM.

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HORNBEAM

(*Carpinus betulus*)

REGARDING the origin of the name, Gerard, in his *Herbal*, tells us that "the wood in time waxeth so hard that the toughness and hardness of it may rather be compared to horn than unto wood, and therefore it was called hornbeam or hard beam": a quaint and likely solution of the name.

Though undoubtedly wild in the South of Britain, the Hornbeam cannot lay claim to be a native of the North, or of Ireland. It approaches the Beech in general appearance, but is usually of more trim and shapely appearance, and, of course, of much smaller growth, for it rarely exceeds 50 feet in height even when favourably situated. The leaves, too, are more deeply serrated than those of the Beech, rougher in texture and with the venations more pronounced, while the bark is dark and smooth and the stem usually fluted. As a hedge plant the value of the Hornbeam is well known, while the fact that it can survive on stiff soils is an additional point in its favour.

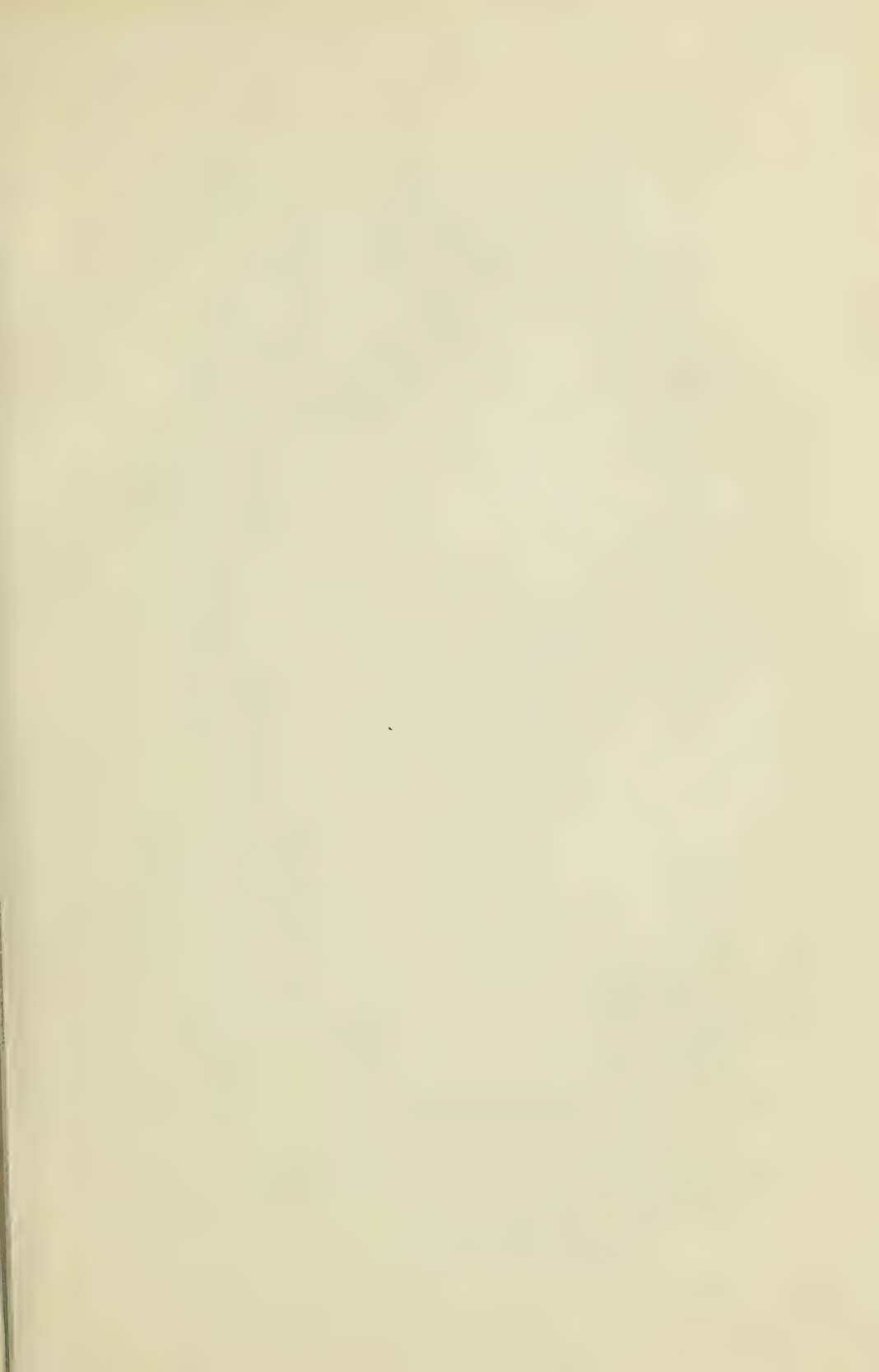
Hornbeam timber is scarce and valuable, and though remarkable for its close grain and even texture, is rarely used for structural purposes. Big logs are particularly apt to become shaky, and,

unless very carefully seasoned, the timber is subject to cracking by which it is rendered unfit for the most important purposes.

For making shoemakers' lasts, it is one of the best woods known, the nail-holes closing up of their own accord. For "bushing" in sawmill rollers and cogs in mill-gearing, it is one of the most valuable timbers, while in the making of skittle alleys and pins, Hornbeam is almost exclusively used. The skittles are 18 inches long by not less than 8 inches in diameter.

The timber of old pollard trees is apt to be of a dark colour and somewhat defective, but that obtained from Epping Forest sells readily and has a high reputation. For agricultural implements, or portions of these, in cabinet-making, and for turnery purposes generally, Hornbeam timber is still in use, while it is one of the best firewoods known. The timber in fully developed trees is of a dirty or yellowish-white colour, hard, tough and remarkably close-grained, with little or no sap wood, and burns well.

The price of Hornbeam timber varies, but that from Epping Forest, where a considerable quantity is annually disposed of, realises as much as 7s. 6d. per stem of 6 to 8 feet in length. Since the war, 10s. per length has been obtained. Pieces 18 inches long by not less than 8 inches diameter, fetch 1s. each for skittles. For skittles, pollards are preferred to maiden trees. Fifty-two trees, containing on an average 23 cubic feet of timber each, were sold at 2s. per foot lately twelve miles from London.



BRITISH GROWN TIMBER.



LABURNUM.

LABURNUM—ENGLISH AND SCOTCH

(*Laburnum vulgare* and *L. alpinum*)

THE English Laburnum, one of the hardiest and most ornamental of flowering trees, was introduced into this country about the end of the sixteenth century. There are two species found commonly throughout Britain and popularly known as the English and Scotch Laburnum. For ornamental effect they are both important, flowering as they do at different periods, and are particularly valuable for planting along the margins of plantations. They are both quite hardy and capable of thriving in bleak and exposed situations, while as to soil, they are by no means particular.

From 20 feet to sometimes as much as 30 feet may be considered the full height to which the Laburnum attains, and stems of more than a foot in diameter are the exception. British-grown wood of the Laburnum is valuable for all purposes where strength and lasting properties are required, but as it is rarely procurable in quantity, the market for this timber is erratic. The wood is of slow growth, remarkably hard and close-grained, and for turnery purposes has few equals.

It is probably the most beautiful of our home-grown woods, being of a dark brown colour, in old

trees black with lighter veining towards the centre. The contrast between the younger wood, which is often bright yellow, and the black and brown of the heart wood is most pronounced. Though rarely of large size, Laburnum timber is of considerable value, being in demand for fancy turnery and as a substitute for ebony. Bowls made of Laburnum wood are recommended on account of their quality, being uniform throughout. Pulleys and blocks made of this timber are of almost everlasting wear, while pegs, wedges, and articles of turnery are made of the wood.

The timber of the Laburnum is remarkable as being valuable even in a young state, branches of, say, 3 inches in diameter being of use for turnery purposes and exhibiting a most beautiful grain. Being hard, it is readily converted to several useful purposes.

Since it is only obtainable in limited quantity, the timber of the Laburnum has no special market nor a recognised price. For large sound logs, £5 per ton has been received, but we have known smaller consignments to realise the equivalent to 10s. per hundredweight, and some twenty trees on a Kentish estate realised 2s. 6d. per cubic foot where uprooted, last winter.

LARCH

(*Larix Europea*)

AMONGST coniferous trees the Larch, from a purely commercial point of view, is by far the most valuable of any cultivated in this country. When we combine its great aptitude to suit itself to nearly all conditions of soils, altitudes and diversities of climate, with its long-established value as a timber tree, rapidity of growth and ease of culture, it is clear that no other coniferous tree cultivated in this country can be ranked on a par with the Larch.

The durability of the wood of the Larch is generally admitted, and this peculiarity is noticeable when the timber is of only a few years' growth and in a comparatively immature condition. The timber of the Larch is almost twice as durable as that of other coniferous woods such as the Scotch Pine, Spruce or Douglas Fir. For mining and railway purposes the durability of the timber makes it much sought after, this being further enhanced by its extreme lightness, a cubic foot when seasoned only weighing 34 lb. Larch, especially in a young state, is specifically lighter than either Spruce or Scotch Fir of similar age. It takes a good polish, works readily under the tools of the carpenter

and is little liable to twist or warp. Substitutes for the Larch as a timber-producing tree have often been recommended; but, in the true sense of the word, none can be accurately termed substitutes. Doubtless some of those timbers whose claims have been set forth might reflect one or more of the valuable qualities of the Larch, but this is the most that can be said.

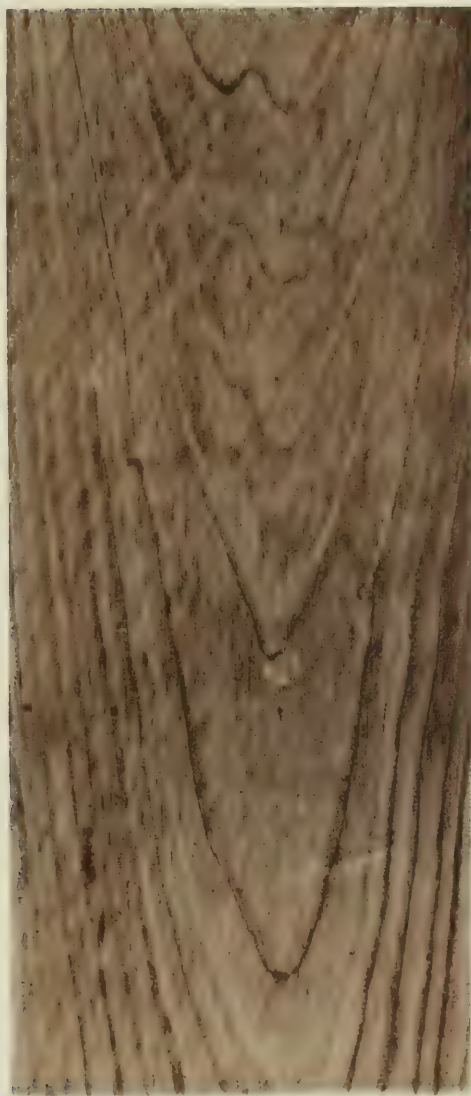
The uses to which Larch timber is applied are many and varied, but the supply by no means equals the demand. For fencing posts and rails, railway sleepers, telegraph poles and in ship-building, Larch timber is largely employed. It is of a yellowish-white colour, clean-grained, tough, strong, and possesses exceptional lasting qualities, even in a young and immature state.

The Larch is not less valuable from an ornamental point of view than as a timber producer, though it is esteemed more for its utility and profit than for its beauty in the landscape. The soft pea-green foliage with its sweet fragrance in early summer, the graceful form of the tree, which seems never out of position, and the sweep of its branches, sometimes erect, sometimes pendulous, are special traits for which the Larch is valued.

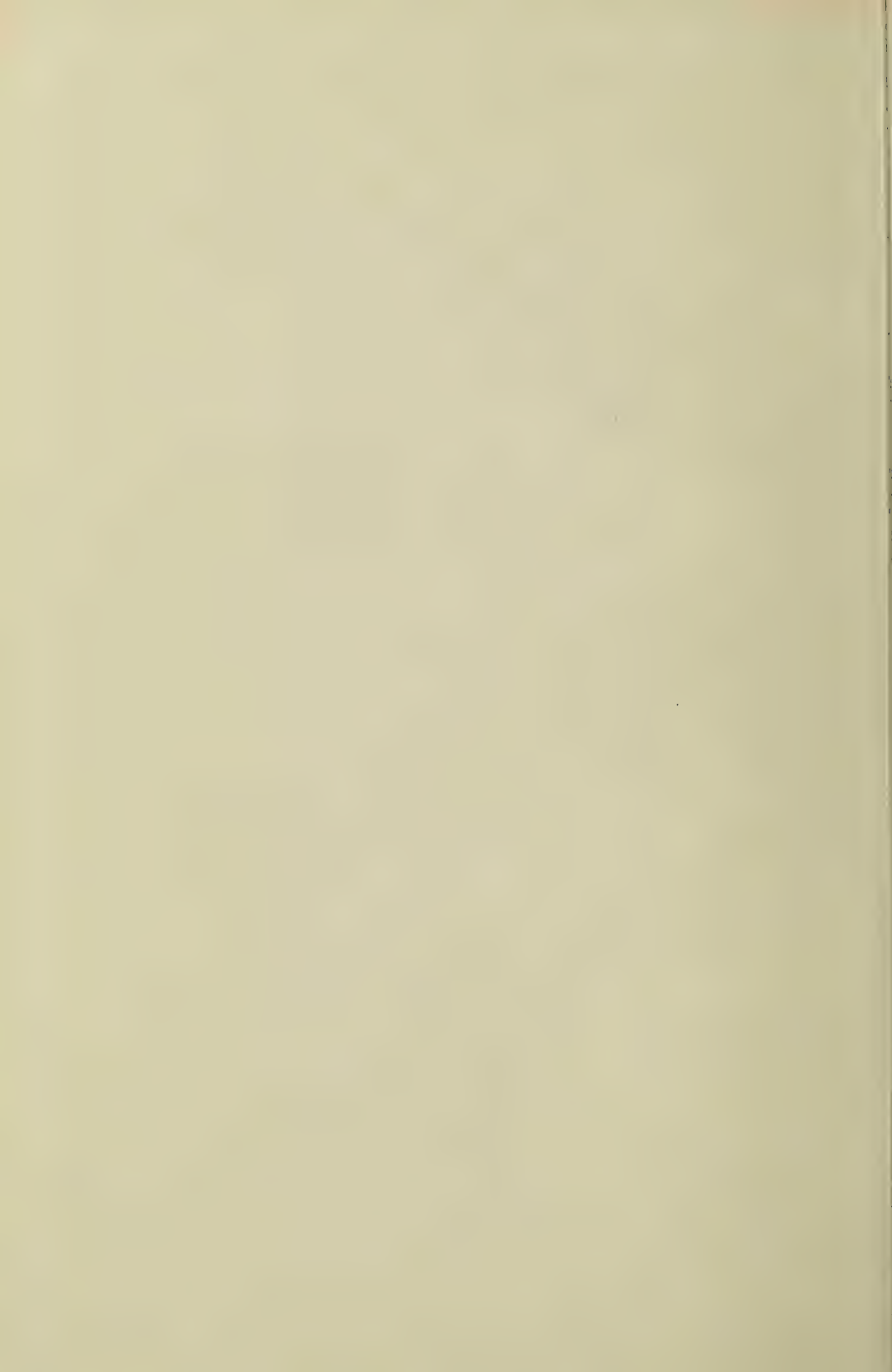
Though as a timber tree the Larch is peculiarly suitable for planting alone, yet the premature high death-rate of the tree, owing to disease and insect attacks, forbids such a course of cultivation.

Of late years the Larch has suffered much from a most insidious canker disease which has spread over the country at such an alarming rate, resulting

BRITISH GROWN TIMBER.



LARCH.



in the spoliation of so many plantations, that it is little short of a national calamity. The planting of hard-wooded trees, such as the Beech, along with the Larch is to be recommended as assisting to keep the cankerous disease in bounds. On warm gravelly soils the Larch is apt to become "pumped" or rotten at the core. Larch timber when old is of a reddish-brown colour towards the heart, the sapwood being yellowish-white. It is tough and strong, but is apt to shrink and has a tendency to warp.

As before stated, the demand for Larch timber is greater than the supply, and since the war started the price has materially increased. For that of the best quality 1s. 4d. per cubic foot is obtained, but the average price realised would work out at about 11d. per foot. Occasionally, as for boat-building, the writer has received 1s. 6d. per foot for special trees.

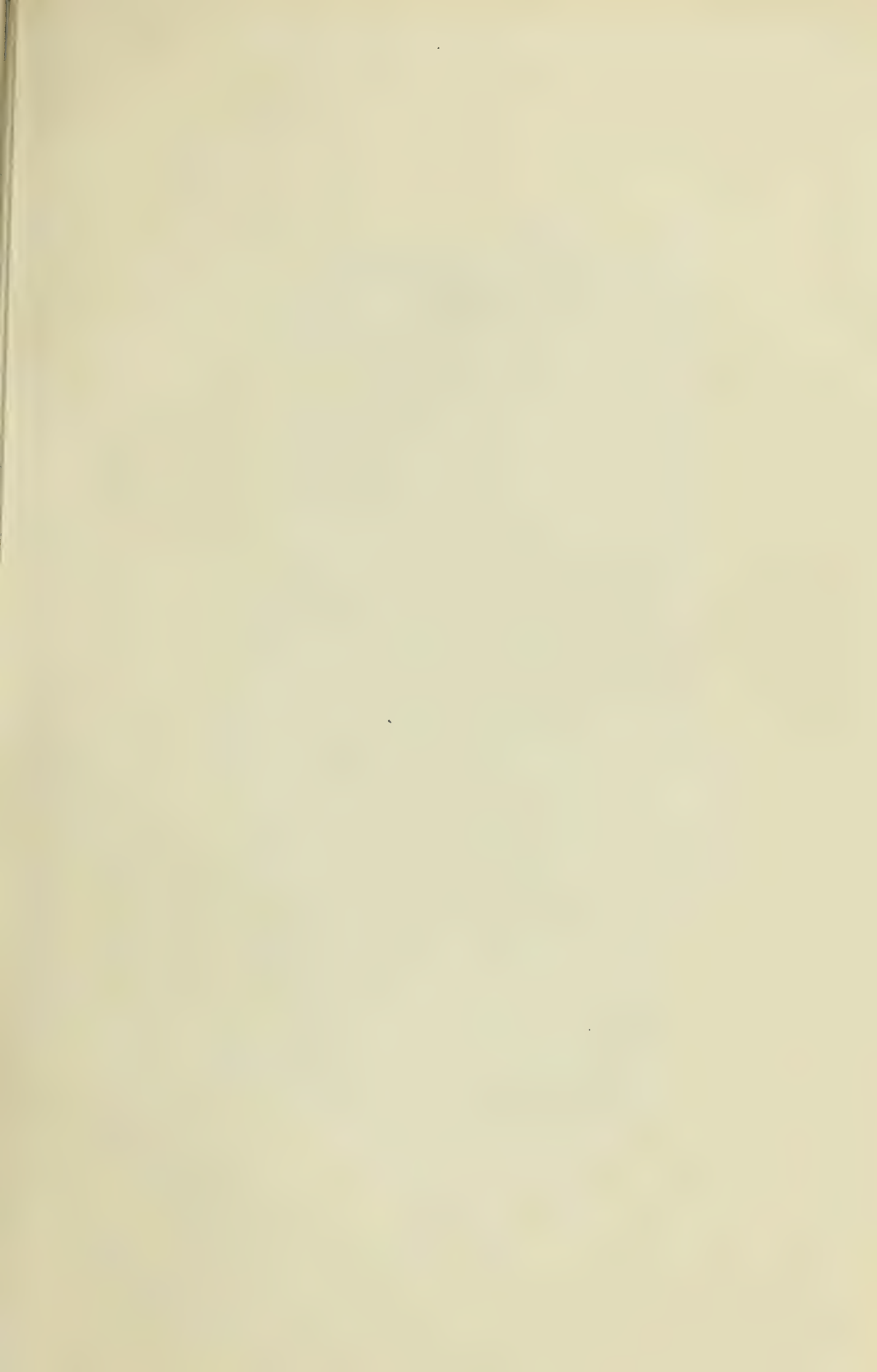
LAUREL

(*Cerasus laurocerasus*)

THE common, or Cherry, Laurel, being one of our most widely cultivated shrubs or small trees, requires no description. As a fence or hedge plant, for growing in the shade, and as an ornamental evergreen it is justly valued. The timber, too, is of excellent quality, hard, firm, weighty, susceptible of a nice polish and valuable for several important purposes. The late Lord Charlemont stated that he sold a quantity of this timber from his estates in Ireland; and we saw about forty tons of particularly fine Laurel wood felled thirty miles from Belfast which was sold by weight at 35s. per ton.

In this particular instance, many of the sticks were 25 feet in length and with a diameter at butt end of 14 inches. All were cut to 3 inches in diameter at top end before being weighed. These unusually large Laurels were growing on the edge of a reclaimed peat bog and in a shady situation, being overtopped by Larch trees of great height.

In England it is rare that timber of the Laurel is offered for sale, but it is well to know that the wood, when of large size, is valuable on the market and can be utilised for several important engineering purposes. The timber is very weighty for its bulk.



BRITISH GROWN TIMBER.



LILAC.

To face page 73.

LILAC

(*Syringa vulgaris*)

THERE is no need to describe the common Lilac, but this much may be said, that apart from its well-known ornamental appearance it is one of the most valuable of smoke-resisting small-growing trees. The timber, as will be seen from our illustration, is most beautifully marked, and when obtained of large size has been turned to useful account by the turner and cabinet-maker. It is hard, comparatively heavy, and works smoothly under the tools of the carpenter, taking a beautiful polish. It is light brown in colour with dark reddish veinings. Though it is somewhat difficult to season without splitting, we have overcome this difficulty by keeping the logs in the round for a couple of years before sawing into boards. There being no recognised market for Lilac-wood, the price is usually fixed by the seller and purchaser. A small parcel in London lately fetched twenty shillings per hundredweight, some of the sticks being 7 inches in diameter.

LIME

(*Tilia Europea*)

THOUGH the Lime is rarely cultivated as a forest tree, yet, it is probably one of the most valuable in the formation of avenues for providing shade. As a town tree it is invaluable, while as it bears hacking and pruning with impunity, it is more often employed for screen and hedge purposes than, perhaps, any other tree, native or introduced. The timber, too, for certain important purposes, has no rival, though its use of late years has been considerably restricted.

As an ornamental tree the Lime is justly recognised, its neat manner of growth and floriferous nature causing it to be largely planted in parks and open spaces as a standard specimen. The flowers, which appear in July, are extremely fragrant, and the fragrance is greatly accelerated by hot, dry weather. Bearing smoke and a heated atmosphere well, the Lime is commonly in use as a town tree, and many avenues and screen fences have been formed of it in both urban and suburban districts. It has a tall, erect, well-rounded trunk, up to 60 or 70 feet high, and when unmolested is generally well supplied with its usually erect-growing branches and numerous semi-drooping shoots.

It is generally supposed that the Lime was intro-



BRITISH GROWN TIMBER.



LIME.

duced into this country about the middle of the sixteenth century, probably from Central Europe where it is indigenous. The Lime is a long-lived tree, and though flourishing best on a rich, dampish loam, yet there are numerous fine examples of the tree to be found on a chalky or gravelly formation.

The timber of the Lime, though not strong, is remarkably close-grained, and light. It cuts clean and easily under the graver's tools, and for this reason, as also on account of its white or slightly yellowish unshaded colour, it has been largely used for ornamental carving. For sounding-boards in pianos it is also in request, while the cabinet-maker and turner make use of the Limewood in a variety of ways. Wagon brakes and shoemakers' and saddlers' cutting boards of Limewood are often preferred, while toys, domestic utensils and packing-cases made from this timber are both light and lasting.

The price of Lime-wood is difficult to state, there rarely being large or continuous consignments offered for sale. Some special trees that were felled in Surrey realised, for cutting into boards for parts of musical instruments, 1s. 4d. per cubic foot. More often, however, Lime is placed with other hardwoods and sold at the usual price of mixed heavy timber or propwood. Where not subject to the alternation of moisture and dryness the wood lasts well and is little subject to insect attacks.

Two Lime trees containing 280 cubic feet of timber were bought by a firm of London pianoforte dealers for £50, just as they lay where uprooted by the storm a few miles from London.

MAPLE

(*Acer campestre*)

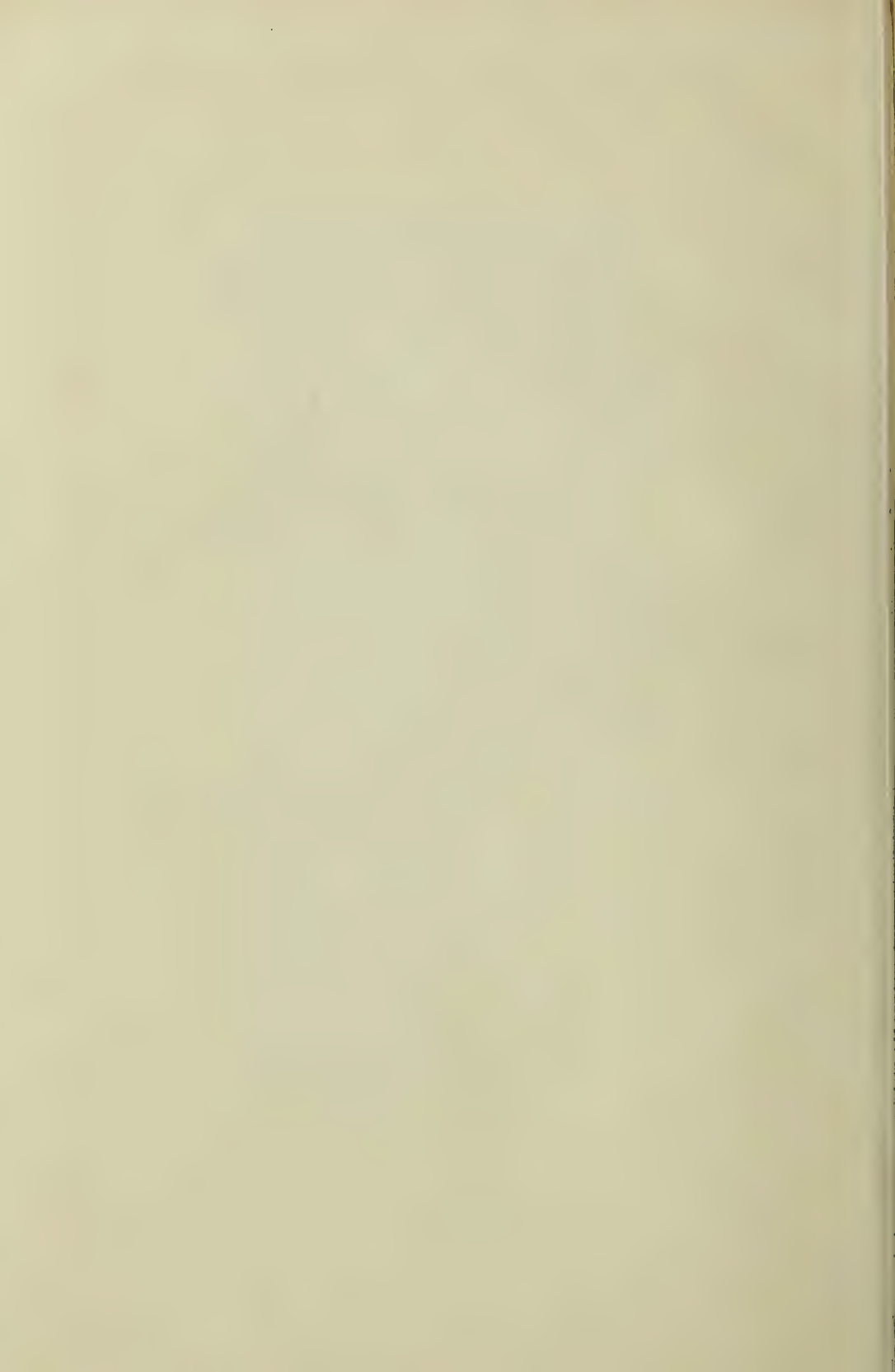
THE common, or field, Maple is a small-growing tree of ornamental aspect and produces, though in very limited quantity, a most valuable timber. In the hedges and field sides of Southern England, preferably on chalky soils, the Maple attains a height of 25 feet, though occasionally, as at the village of Downe, in Kent, specimens 35 feet high are to be seen. It is quite an ornamental tree with its numerous twiggy branches and small, deeply cut leaves, which put one in mind of those of the Hawthorn, with the creamy coloured bark deeply furrowed and quite corky in appearance. The timber, when of large size, is much sought after by cabinet-makers, and in the cotton and jute factories it is put to special uses, while it enters into the construction of musical instruments and is largely used in turnery, and by the picture-frame maker.

Maple-wood is of fine grain, often twisted and curiously marked with mottled figuring, and takes a nice polish. The value of the wood cannot be said to be fixed, it being obtainable only occasionally and usually in small quantity; for these reasons, the trees, singly or in small numbers, are mixed up with other kinds of hardwood for sale. For

BRITISH GROWN TIMBER.



FIELD MAPLE.



several large trees, 2s. per cubic foot was recently obtained, the timber when cut into planks being remarkably distinct in graining and beautifully mottled. The price usually obtained is 1s. 3d. per foot.

Several other species of Maple, of foreign extraction, are cultivated in this country for ornamental purposes, such as the Norway Maple, a handsome, fast-growing tree, that is well suited for maritime situations. The scarlet and snake-barked Maples are also grown in this country, but only for ornamental effect.

MULBERRY

(*Morus nigra*)

THE timber of the common Mulberry when obtainable in large size is valuable as cabinet wood, and is frequently turned into fancy articles for the household. It is a smooth, clean wood of rich colour, with a distinct and beautiful grain; and is little apt to crack or warp, while its lasting properties are well known. For firewood purposes it is greatly in request.

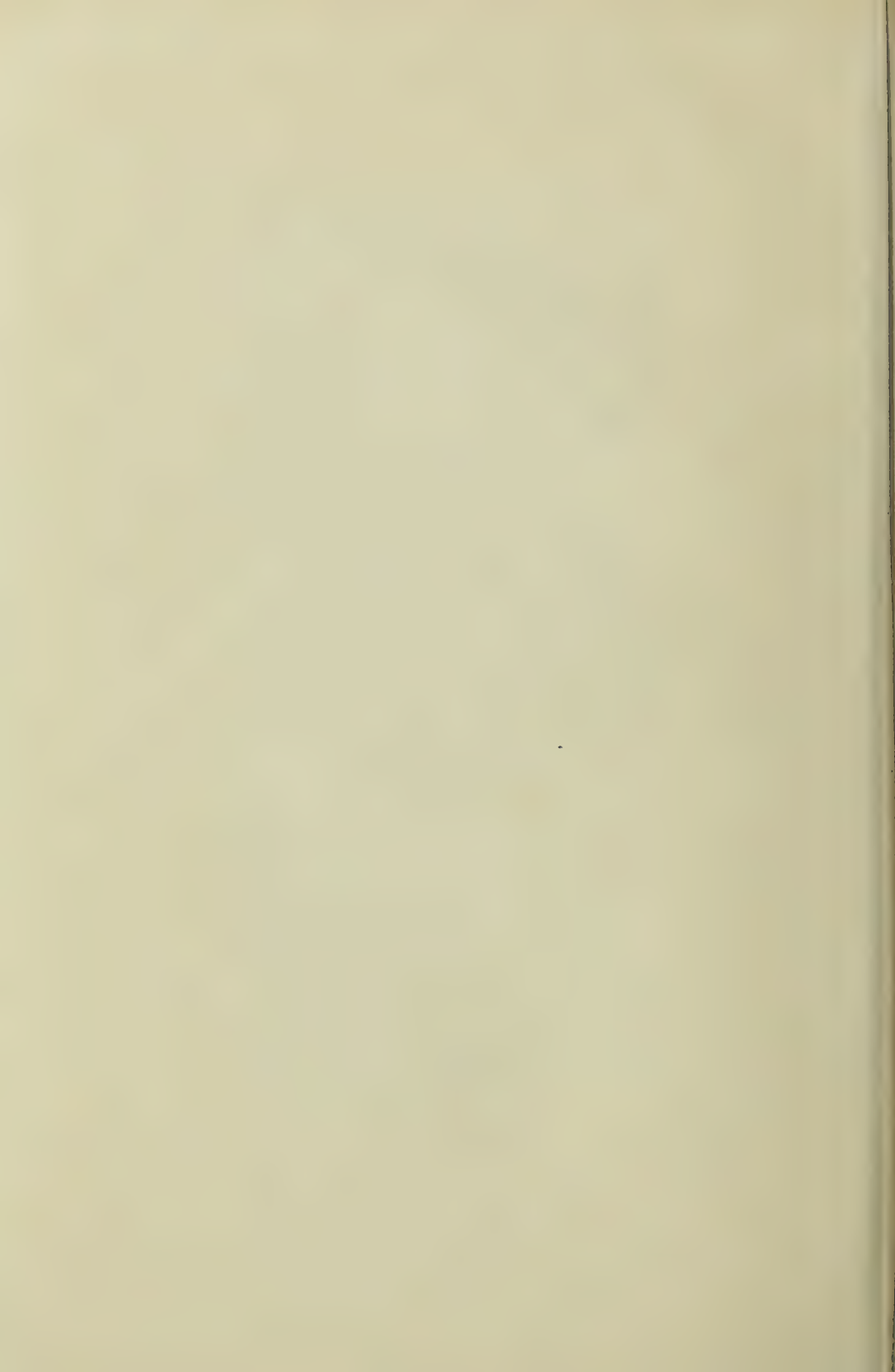
The Mulberry is so well known as a lawn and park tree that a description of it seems unnecessary. Generally, it produces fruit in abundance, while the leaves are used as food for the silkworm. As an ornamental tree of small, neat shape, the Mulberry is well known, while it is one of the best of town trees, succeeding in some of the most smoke-infested parts of London. It rarely exceeds 30 feet in height, and when old is apt to get heavy-headed and lose the larger branches.

It is difficult to quote a price for Mulberry timber, specimens of which occasionally reach 18 inches in diameter, but for a few special trees that contained on an average 25 cubic feet of timber each, the selling price was 1s. 6d. per cubic foot. For a single tree that was recently uprooted by the storm in London, and which contained 34 cubic feet of timber, £5 was received.

BRITISH GROWN TIMBER.



MULBERRY.



OAK

(*Quercus Robur*)

AMONGST our hard-wooded trees the Oak is probably the best known and the greatest favourite, and, apart from historical associations, the most valuable and useful. The Oak was for long associated with National Defence by reason of the important part it played in shipbuilding, but with the advent of iron and steel, the glory of the "wooden walls" of England has for ever departed.

Apart from shipbuilding, however, there are many uses to which the timber of the Oak is applied, one of the most noteworthy being the making of furniture, for which the knotted and intricately designed wood of pollard or brown Oak is particularly valuable. Wheel and coach wrights find in it the best wood for the bottoms of carts and wagons, while the builder uses Oak timber for doorposts and for the strong framing of domes, spires and roofs of public buildings. There are also innumerable minor uses to which Oak timber is applied, such as its employment in fencing, and for railway "sprags" and pit-chocks. It makes excellent charcoal and is one of the most valuable woods as firewood.

The Oak lives to a great age and possesses wonderful recuperative powers, continuing to vegetate long

after the trunk is hollow and diseased. The Oak suffers from its branches being broken by autumn gales before the leaves are shed, while the timber is liable to "shake" the result in all probability of its being grown in unsuitable soil. It survives for several hundred years, attains a height of from 80 to over 100 feet, with widespreading, heavy limbs, and frequently contains several hundred cubic feet of timber.

Though the Oak succeeds in a great variety of soils and situations, it produces the best quality of timber in heavy loam or that of a clayey description. It is generally agreed that the best Oak timber in England, for which the demand is greatest and the highest price is obtained, is produced in a calcareous formation and in upland situations in the county of Sussex. Hedgerow or field Oaks are preferred to those of plantation growth, and those from upland situations to such as are cultivated in lowland and sheltered positions. In the latter case, the production of timber is greatest, but the quality inferior.

Two forms of British Oak are generally recognised and botanically known as *Sessiliflora* and *Pedunculata*, the leafstalk of the former being often half-an-inch long, while in the latter it is entirely wanting. The habitats of the two are also more or less distinct, *Pedunculata* being the typical tree of the lowlands, occurring on clays and marls in the Oak-woods of Southern England. *Sessiliflora* on the other hand, favours upland non-calcareous districts, and in the North and West is the prominent

tree. The timber produced by *Sessiliflora* is supposed to be of inferior quality to that of *Pedunculata*, though merchants rarely favour one more than the other.

Not infrequently, particularly in old buildings, the wood of the Chestnut has been mistaken for that of the Oak, as was the case with the timbered roof of Westminster Hall, but the following letter which we have received from the Rev. G. H. Vaughan, Rector of St. Michan's Church, Dublin, leaves little doubt that the original roof of Westminster Hall, one of the glories of timber architecture, was constructed of Irish Oak:—

“ In reply to your inquiry regarding the timber used for the roof of Westminster Hall in 1098, I send you an extract taken from *Memorials of St. Michan's* :

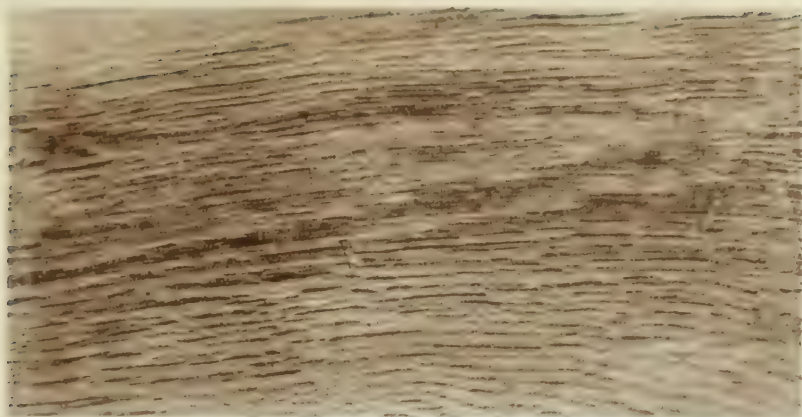
“ ‘ Stanihurst findeth that Anno 1095 there came certain Easterlings to the North Side of Dublin adjoining to the Liffey and settled themselves there so that of them to this day it is called Ostmontown, and corruptly Oxmantown, in the parish of St. Michan of one Michanus, Dean and Bishop, who founded the church unto whom Murchard, or Murchough, King of Leinster, gave that parcel of land to that use. The free ground or common now called Oxmantown Green was all wood. He that diggeth at this day to any depth shall find the ground full of great roots. From them Anno 1098 King William Rufus by licence of Murchard had that frame of wood which made all the roof of

Westminster Hall, where no cobweb or spider breedeth to this day.' "

Assuming that the Oak trees from which the roof of 1399 was reconstructed were at least 200 years old when felled—and it is very unlikely that younger trees would be chosen for so important a purpose—the timber would thus be over 700 years old. Generally speaking, the timbered roof is in a fair state of preservation, some of the wood being as sound as when placed in position at least seven centuries ago. The effects of insect attack are, however, to be noticed in some of the logs. Though varying in appearance, much of the timber is of a rich dark brown colour, in some cases of cinnamon brown, and some of the beams measure about two feet square. Judging from the appearance of the timber in various parts of the roof, we are strongly of the opinion that during the alterations and repairs of 1397, the best of the original Irish Oak was retained, and, in conjunction with other timber of the same kind, used in the present roof. That the original timber was of Irish origin is certainly surprising when we consider the vast forests of Oak that were at that time to be found in many parts of England, particularly in the counties of Kent, Sussex and Surrey, and within easy reach of the Metropolis.

Brown Oak Timber.—What is known as brown or red Oak is only found in this country, and in less than a dozen stations there. The cause of the Oak timber turning a rich brown is still a vexed question,

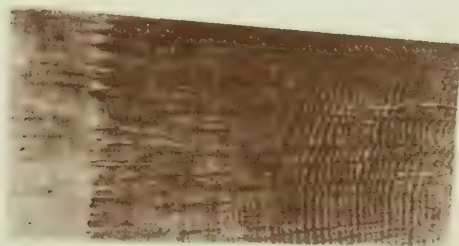
BRITISH GROWN TIMBER.



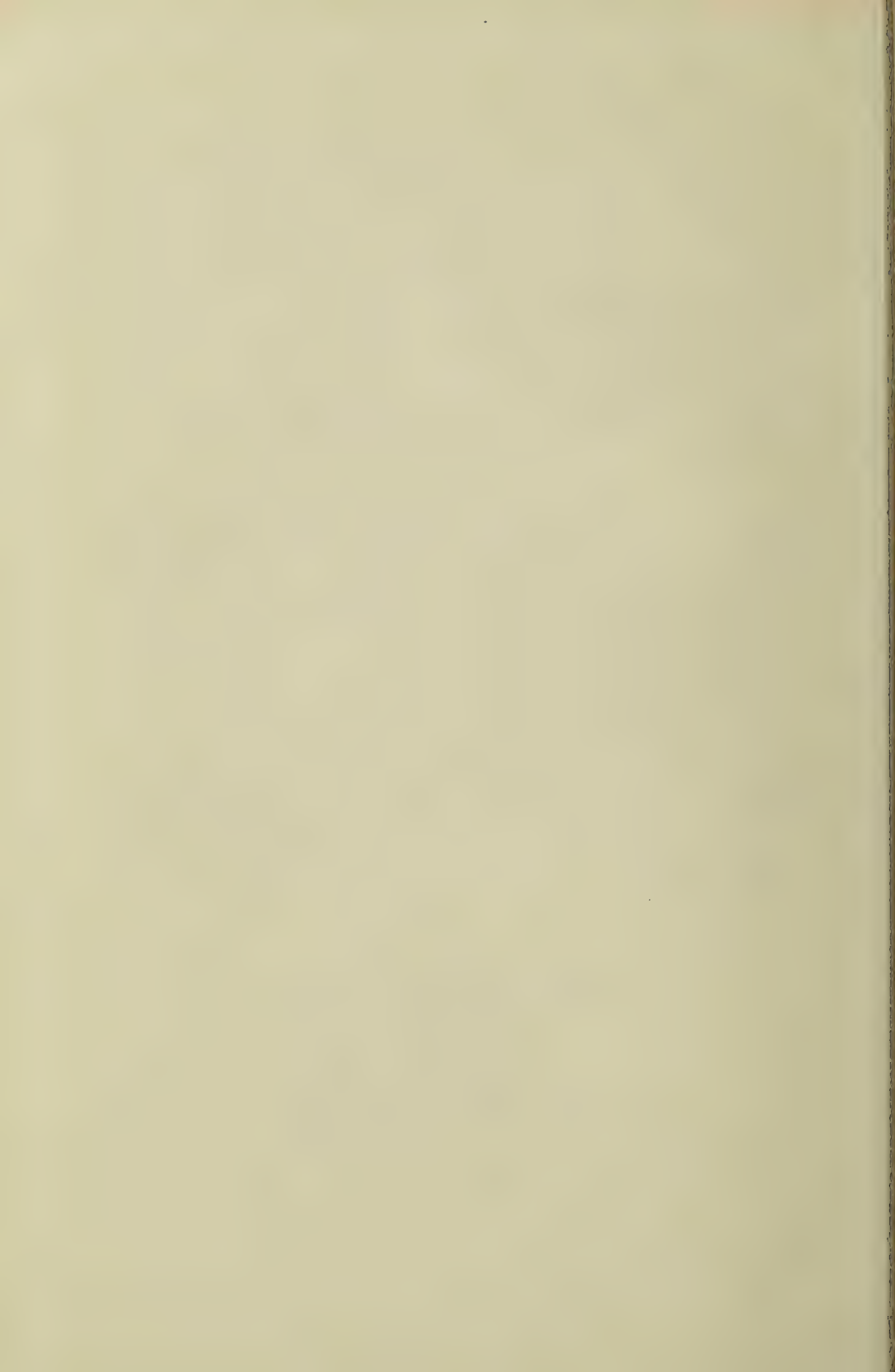
EVERGREEN OAK OR ILEX.



BRITISH OAK.



BROWN OAK FROM WELBECK.



though it is generally ascribed to certain properties in the soil; in some cases the timber is brown from infancy. Mr. W. Michie, Woods Manager to His Grace the Duke of Portland, whose experience with the tree is perhaps greater than that of any other person, considers that the particular Oak which produces the brown timber is a distinct variety. If this is so, it is difficult to understand why the tree is found in so few localities and only in this country, for it is principally confined to Northamptonshire, Beds, Herts, and a few other counties.

In the case of Oaks that have been pollarded the wood may be brown from decay, and certainly all those at Ampthill, in Bedfordshire, where some of the finest brown Oak timber is found, are in such a condition. There is, however, considerable difference in the colouring and texture of woods produced by pollarded and unpollarded or maiden trees. That of the maiden tree is of plainer figure, straighter in grain, and generally of lighter colour. The timber of the pollard, brown or red Oak, is usually of fantastic graining with a great variety of beautiful figuring, owing largely to the growth being stopped vertically and spread over the butt end.

The timber is of considerable value, ranging in price from 5s. to 10s. 6d. per cubic foot, and as much as from £50 to fully £100 has been received for a single tree. It is cut into sawn veneers and used for the best class of sideboards and furniture, the veneers counting from forty to fifty to the inch. Although of a much darker colour than that of the common Oak, the timber of the brown or red Oak

is comparatively lighter in weight, specimens from Welbeck weighing 60 lb. to the cubic foot when seasoned.

Green Oak Timber.—The beautiful vivid green colour assumed by Oak timber under certain conditions is due to the action of the fungus *Peziza æruginosa*, the colouring matter being quite permanent in the timber. As the colour cannot be destroyed, wood so affected is much sought after by the makers of fancy furniture. Trees growing in damp, shady positions are most often attacked by the fungus, and we have known timber of the Oak when left undisturbed in a damp part of the woodland to assume this colour.

Owing to the scarcity and high price of green Oak timber, experiments have been undertaken to produce the desirable green colour by artificial means, but without success. The wood is hard, and the beautiful graining of the Oak is shown to great advantage in this green timber. It is remarkably scarce, the finest examples I have seen being grown in Kent and on an estate in Northern Ireland.

As with most other timbers of home growth, the price of home-grown Oak varies greatly from 1s. 3d. to 2s. 6d. per cubic foot. At a recent sale on the Farming Woods Estate, Northamptonshire, some oak trees from the historical Rockingham Forest averaged £21 per tree, one of the largest realising £105 and another £76. The price of the best quality Oak has gone up with the war and the demand has greatly increased. Oak timber from districts where that of the best quality is produced always fetches

the highest prices. Local demand and the situation of the trees has often much to do with the price realised.

Turkey Oak.—The Turkey, or Levant, Oak, which was brought to this country in 1735, is one of the most desirable of deciduous trees. From our native Oak it is readily distinguished by the deeply serrated leaves and bristly scales on the acorn cup, as also by the comparatively long, linear bud-scales and stipules. It is unlike the British Oak, too, in that it rarely produces heavy, tortuous branches, though in rate of growth it far surpasses our native species, being open and upright of habit and more inclined to throw its vigour into the production of the trunk than into weighty and far-spreading limbs.

The timber of the Turkey Oak bears no comparison with that of our native tree as far as lasting properties are concerned. It has, however, a beautiful grain and polishes well, but is apt to be attacked by insects. We have used it in the making of park and garden seats which were constantly exposed to the weather with very satisfactory results. Some of these seats have been in use for thirty years on the Holwood property of Lord Derby, and when examined lately, were found to be quite sound though unpainted. Timber merchants, however, fight shy of the wood of the Turkey Oak; in a word, it has a bad reputation and is carefully avoided by the carpenter and wheelwright. The selling price is from 1s. to about 1s. 2d. per cubic foot in the woodland, but it is often difficult to find a purchaser for even large, sound trees.

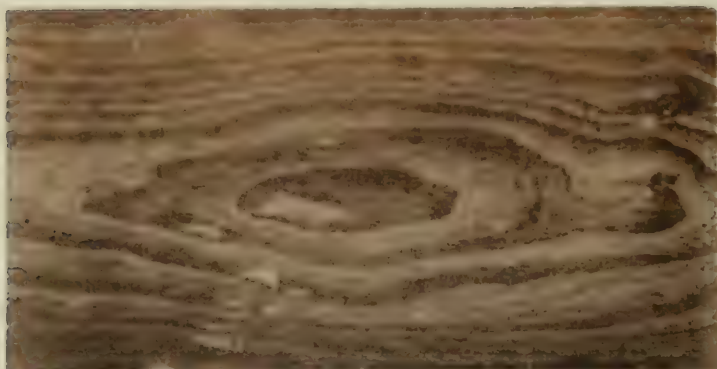
THE EVERGREEN OAK

(*Quercus Ilex*)

As a shelter-giving tree, especially in maritime situations, the Evergreen Oak is well known and justly recognised as one of our most valuable evergreens. It attains to a large size, often 60 feet in height, with a stem 4 feet in diameter, and in exposed seaside situations, as at Walmer Castle, in Kent, where from the frequency and force of the storms few trees can succeed in a satisfactory way, the Evergreen Oak stands nobly out and affords a great amount of shelter to other less hardy species.

The timber of fully matured trees is remarkably hard and close-grained, richly coloured, and takes a satiny polish (see illustration facing p. 82). It lasts well, as a number of uses to which the timber of trees that were uprooted on the night the *Royal Charter* was wrecked on the coast of Anglesey bear witness. At Penrhyn Castle, in Wales, the wood has stood the test of time in a commendable way, especially when used indoors, though fencing posts and boarding cut from thoroughly matured wood have also given every satisfaction. The price of the timber is not fixed, but for several wind-fallen trees 1s. 2d. per foot was obtained.

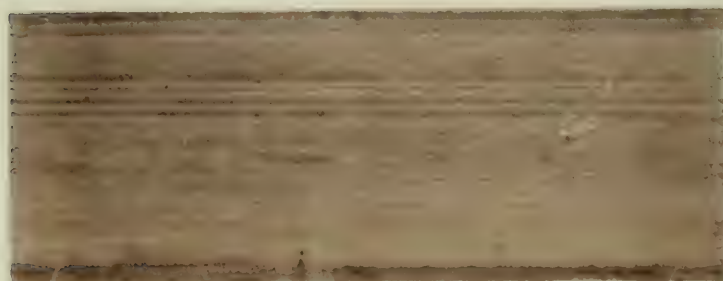
BRITISH GROWN TIMBER.



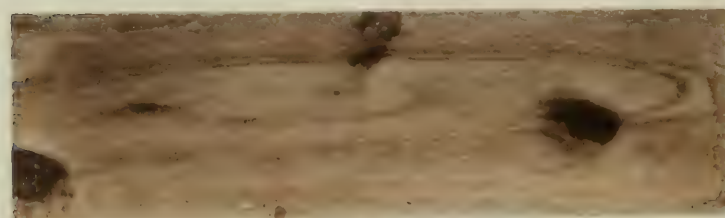
BUCKTHORN.



PAULOWNIA.



PRIVET.



LAUREL.

PAULOWNIA

(*Paulownia imperialis*)

THOUGH sparsely distributed throughout Britain, the timber of the Paulownia is one of the lightest of any of home growth, and probably on this account has passed by unnoticed. It is one of the most ornamental of hardy trees, with its ample, deep green foliage and flowers distinct from those of any other species. The leaves are ovate-cordate in shape, often 10 inches long and covered with a greyish woolly tomentum, while the sweetly scented foxglove-like flowers are purplish-violet, distinctly spotted and borne in terminal panicles.

We have had several opportunities of testing the timber of the Paulownia grown in this country, and the results have been satisfactory, some of the stems converted being nearly 2 feet in diameter. One peculiarity of the wood is that it neither warps, splits, nor shrinks. However thin the boarding may be cut there is no tendency to warping. It is, as will be seen from the illustration of timber grown in London, of a beautiful yellowish-white colour, and so compact that the graining is hardly visible. For veneering purposes it is largely used by the Japanese. It is also used in wardrobe making on account of its resistance to damp. There is no fixed price for this timber.

PEAR

(*Pyrus communis*)

THE timber of the Pear is used for purposes similar to that of the Apple, also for walking-sticks when dyed black to resemble ebony. It is a hard, heavy wood of great strength and solidity, and when obtainable in quantity, as, for instance, when the trees in an orchard are being grubbed out, a ready market may be found for it at a remunerative price.

Like the wood of the Apple, that of the Pear, Plum, Cherry and other fruit trees is usually sold by bulk, though in some special cases by the ton weight or by the cubic foot. The price of Pear timber varies with the quantity offered, but is usually similar to that of the Apple. Some one hundred and twenty trees of Apple, Pear and Cherry were lately sold on a Kentish fruit farm at a price which worked out at 1s. 2d. per cubic foot. Some of the Pear trees were 16 inches in diameter and clean for 10 feet in length. One of our largest dealers in timber asks 3s. 6d. per foot for seasoned Pear logs put on rail.

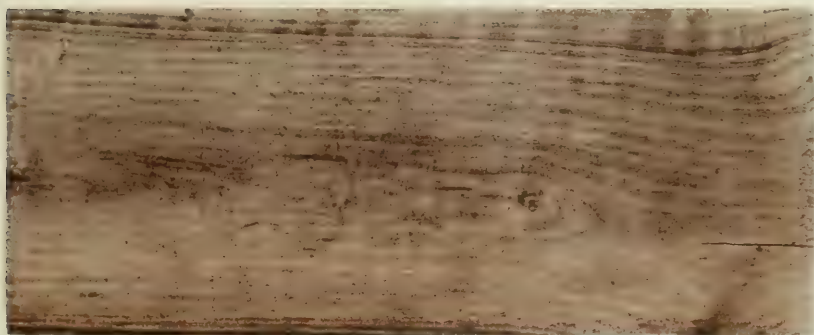
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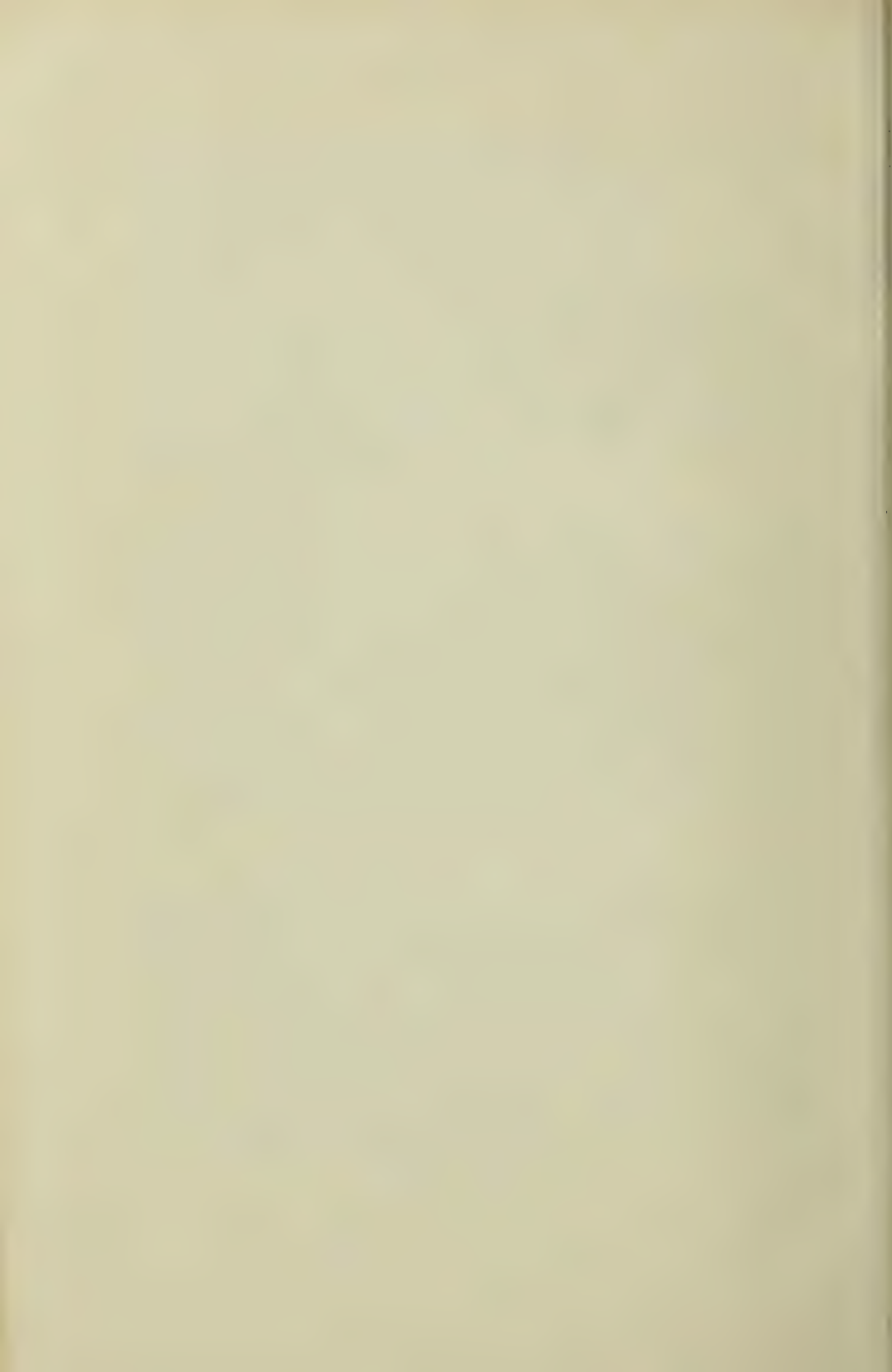
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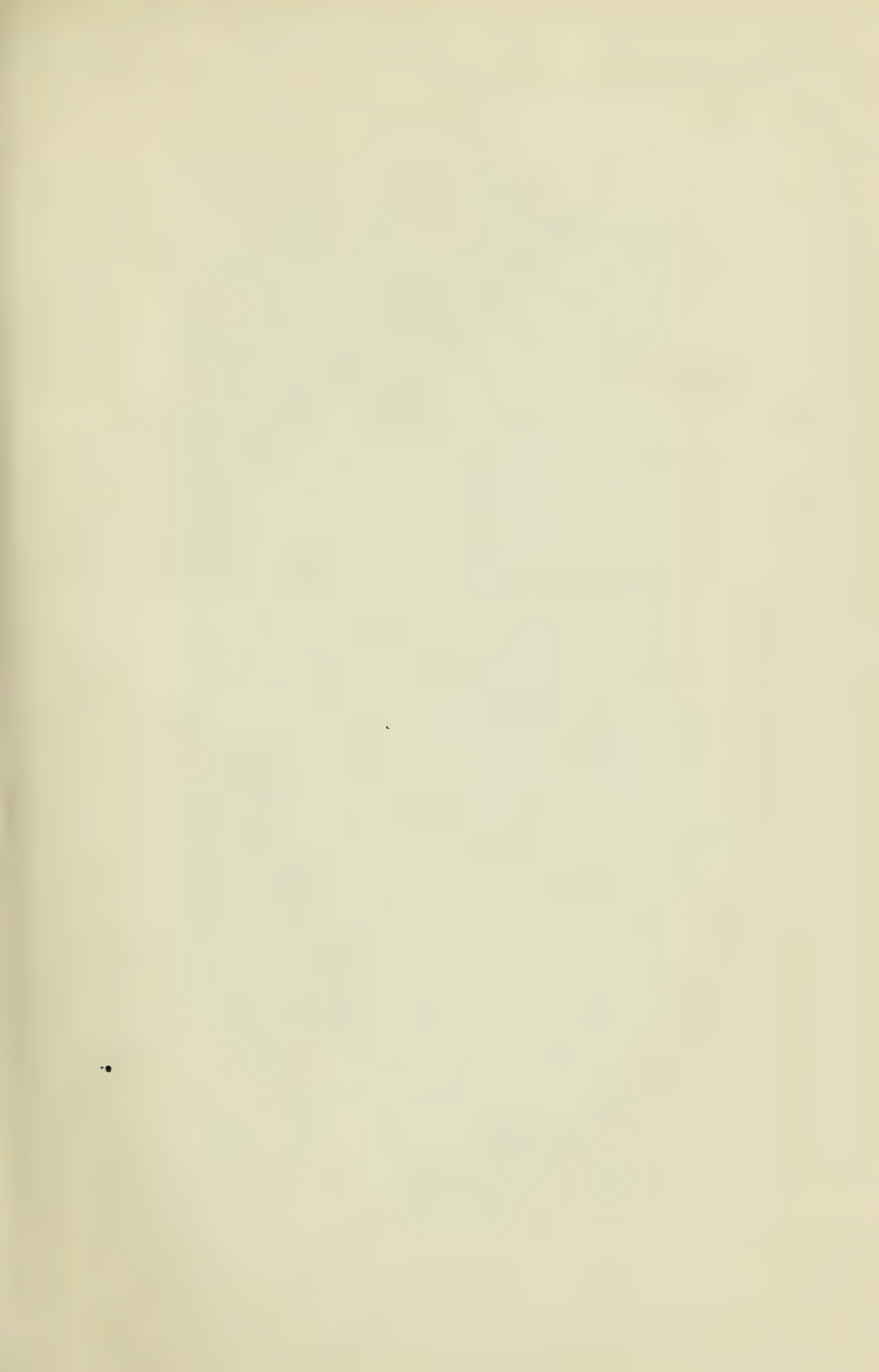


PEAR.



WHITEBEAM.





BRITISH GROWN TIMBER.



EASTERN PLANE.

PLANE

(*Platanus orientalis* and *P. occidentalis*)

THERE are two distinct species and several varieties of the Plane tree cultivated in this country. By far the most useful and generally planted is that known as the London Plane, a name that has been acquired on account of the tree succeeding so well in London and other large towns and smoke-infested areas. The two species are known as the Eastern and Western Plane; the latter, however, being a rare tree, and not usually cultivated in this country.

It is not generally known that the so-called London Plane, which succeeds so well along the Thames Embankment and in other parts of the Metropolis, is not the true Eastern Plane, but a distinct and well-marked variety known as the Maple-leaved Plane (*Platanus orientalis acerifolia*). From the species it is readily distinguished by the less deeply divided leaves, and from the Western Plane by the several heads of fruit which are attached to each peduncle, those of the Western Plane being usually produced singly.

The Eastern Plane is, in this country, a tree of noble growth, and, when suitably placed, rapidly attains a large size, with a clean, well-rounded trunk and head of far-spreading branches. It is

an avenue tree of the first class, excelling alike in general style of growth, noble proportions, foliage tint, and beautifully marbled bark.

The Plane delights in a rich, dampish loam, where, as at Ranelagh and other places around London, it will attain a height of 90 feet, with a stem often 6 feet in diameter. For town planting the Plane has, perhaps, no equal; and succeeds in the most smoke-infested districts of the great Metropolis, where, indeed, some of the largest and healthiest specimens are to be found. Apart from the value of the Plane as an ornamental tree and for planting in smoky localities, its timber is of considerable importance commercially, though it is rarely obtained in such quantity as to become a constant market commodity. In the making of pianofortes it is largely in use for bridges, the toughness and strength of the wood causing the pins to be securely held in position. For coach-building, too, Plane-wood is largely employed, and in it the turner finds a most useful timber. British-grown wood is quite equal in graining and quality to that sent from abroad, and numerous experiments that have been made with the timber of London-grown trees prove that it is most durable and readily worked. As firewood it is one of the best woods, burning clearly and freely, and emitting a great heat.

Several large trees that have been felled of late in the Metropolis yielded nearly one hundred cubic feet of timber apiece, and were sold at 1s. per foot where uprooted.

PINE

(*Pinus silvestris*)

Scotch Pine.—This is the only Pine indigenous to Britain, and from the fact that its chief native habitat is the Northern Highlands, the name of Scotch Fir has been derived. From the remains of this tree that are found in the peat-bogs of Scotland and Ireland, it is probable that in early ages the greater part of Britain was covered by Pine forests. Be that as it may, no forest tree of our acquaintance adapts itself more readily to different soils and climatic conditions; and though named the Scotch Pine it is by no means peculiar to Scotland, having a wide geographical range throughout the northern part of the Eastern Hemisphere.

In lowland districts, where it is much used as a nurse tree, forests composed entirely of the Scotch Pine are rarely found, whereas in the northern parts, up to 1500 feet altitude, plantations of this tree are not uncommon. The valleys of the Spey and Dee are the famous districts in Scotland where the tree is found at its best and in greatest abundance; and at Braemar, Abernethy, Rothiemurchus, Glenmore, Monymusk and Glentanner, large areas of the Scotch Fir are to be found. The famous Ballochbuie Forest, at Invercauld, which is owned by the

King, is now considered to be the most valuable Pine forest in Scotland. As to the soil in which this tree does best and in which it produces the most valuable timber, that of a light gravelly or sandy loam, preferably on a granite formation and with a northern aspect, is preferred. Though the Scotch Fir will grow up to an altitude of nearly 2000 feet, it has been found that the perfect development of the tree takes place at a lower level, say, from 500 to 700 feet. It may well be placed next to the Larch for economic planting.

From a purely commercial point of view the timber of the Scotch Fir is of considerable value, being largely utilised for many constructive purposes. The quality of wood, however, varies greatly, the best being close-grained, hard and resinous, as it is found in the Northern Scottish forests, and those of Russia, Germany, Norway and Sweden. In England as a whole, the wood is inferior to that produced in Scotland. Under the names of Red Fir and Yellow Fir, or following the name of the port of shipment—Memel, Riga and Dantzic—the timber of the Scotch Pine is imported to this country in large quantities. The uses to which it is applied, are various, including pitprops, palings, builders' laths, staves and fencing. When planked out of large trees, the timber is used for house joinery, railway sleepers, boarding under slates, outside buildings of a temporary kind, headings for barrels, boxes and packing-cases. For war purposes Scotch Pine timber has, of late, been much in request by the Government in the making of packing cases,

BRITISH GROWN TIMBER.



WEYMOUTH PINE.

with the result that the price has risen considerably. For first quality timber, of large size, the price is about 10*d.* per cubic foot, but plenty may usually be had at from 7*d.* to 8*d.*, of smaller dimensions and inferior quality.

The Weymouth Pine (*P. strobus*), though curiously erratic in the quality of timber produced in this country, is in certain situations a most useful, fast-growing tree; and, where conditions are favourable, should enter into the composition of our woods and plantations. At Gwydyr Castle, in Wales, the Weymouth has done excellently on loose, shaly rock, and on an elevated plateau near the old chapel, trees containing upwards of 200 cubic feet of timber, with straight, clean boles, some of which rise to 90 feet in height, may be seen. Five of these trees which we measured lately, contained fully 1200 feet of timber and girthed from 9 to 10 feet at a yard up the stem. On warm, gravelly soils at Penrhyn Castle, also in Wales, some of the trees, which averaged 55 feet in height, were "pumped" or rotten at the core; but others contained valuable wood.

In Surrey the Weymouth has done remarkably well, trees of seventy years' growth having yielded a profit of over £69 per acre.

The timber is light, clean and easily worked, and a comparison of home-grown wood of a tree that contained 90 feet with timber sent from abroad revealed but little difference. Under the name of White Pine, the timber is largely imported to this country and used for a variety of purposes in con-

nection with building. In some of the woods at Woburn Abbey and elsewhere the Weymouth Pine reproduces its kind freely from seed, and advantage has been taken of this method of reproduction to stock open portions of the woodlands.

From a purely ornamental point of view the Weymouth Pine is a valuable tree—the light, almost silvery, appearance of the feathery foliage and ashen grey bark being particularly effective. The price of the timber is similar to that of Scotch Pine of equal size, at least, this was obtained for a large number of the trees during the past season on an estate in Kent. For Scotch and Weymouth, growing in the same plantation and of equal age, 10*d.* per foot was the price obtained.

The Corsican Pine (*P. Laricio*) is another valuable forest tree, and one that, like the Scotch, will succeed and produce large quantities of timber on poor, gravelly soils. In 1886, or thirty years ago, the writer carried out a number of experiments with home-grown timber of the Corsican Pine, the wood being cut from trees of fully fifty years' growth which contained, in some instances, 70 feet of timber, the boards being 27 inches wide and planked from trees that girthed 9 feet at breast-high. Though, generally speaking, the timber has lasted well, yet in some instances, the loss of resin has caused the wood to become honeycombed.

The price obtained for timber of the Corsican Pine is much on a par with that of the Scotch, though in one instance, an extra 2*d.* more per foot was secured for the former.

BRITISH GROWN TIMBER.



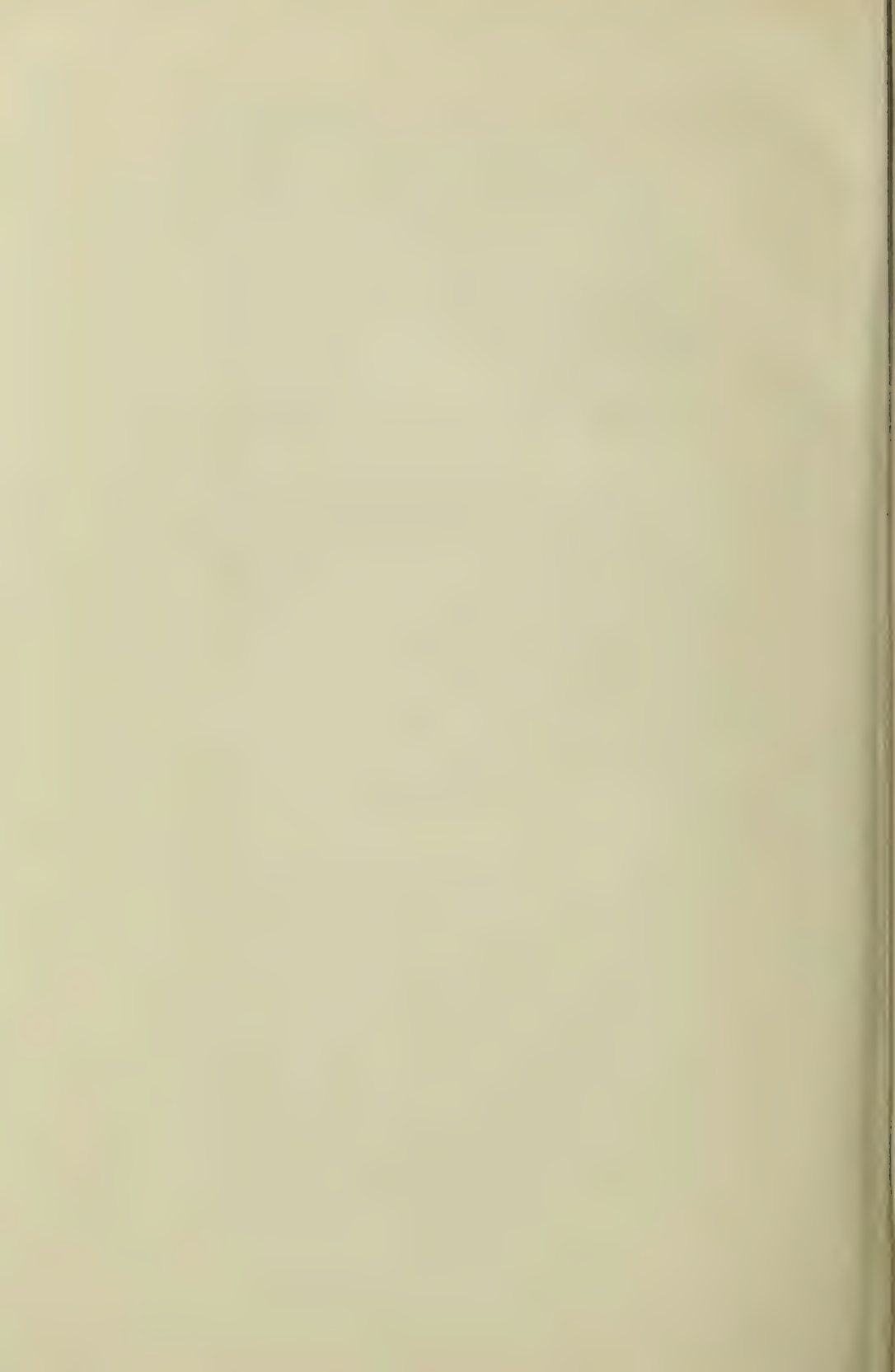
CORSICAN PINE.



AUSTRIAN PINE.



SCOTCH PINE.



The Austrian Pine (*P. Austriaca*), for shelter-giving purposes, is a valuable tree, but the timber is usually rough, knotty and hard to work, even when the trees are grown in close order. It is very resinous, of a dirty yellow colour, and stands the changes from wet to dry as well as any other home-grown timber. Some experiments made with the wood by the banks of the Ogwen River, in North Wales, turned out satisfactorily. The Austrian grows well in almost any class of soil, calcareous preferably, and bears exposure well.

Regarding the rate of growth and cubic contents of timber of the Corsican, Austrian, Weymouth, and Scotch Pines, and the Larch, the following will be interesting:—

Twenty-five years ago, at the instigation of the then Earl of Derby, the writer formed several plantations on the Holwood Estate in Kent. At the outset, it may be well to state, that these plantations were not formed with the object of producing valuable timber, but rather for the purposes of ornamentation and privacy. The trees used were the Scotch, Corsican, Austrian and Weymouth Pines, the Larch, and several species of hardwoods; and as all have succeeded well under exactly similar conditions, the following notes as to the rate of growth and production of timber, both of which are unusually great, during a period of twenty-five years may be instructive.

Previously to being planted, the land, which may best be described as a hungry loam on a gravelly subsoil and sheltered, was let out for rough grazing

and the cultivation of strawberries and other fruit.

The cost per acre of forming these plantations was—

	£	s.	d.
Pitting, 2722 at 1s. per 100	1	7	2
Planting	1	1	0
Trees, at 40s. per 1000	5	8	0
	£7	16	2

This price may appear both high and low, but in connection with the former, it should be explained that the coniferous trees, when planted, were about 16 inches high, the others about 3 feet, all being placed 4 feet apart. Owing to the land having recently been under cultivation, and labour at that time cheap in the district, the opening of pits was carried out by contract at quite a nominal rate, the size of each being 12 inches square and 9 inches deep. After being planted, the trees required little attention for the first six years, at the end of which period they averaged 8 feet in height; and the shade occasioned by the branch-spread had killed out most of the grassy undergrowth.

As the plantations were primarily intended for ornament and shelter, the retention of the lower branches of the trees, at least along the margin, was imperative, and in order to ensure this, early thinning was carried out at regular intervals up to the present time, care being taken always to allow the boundary trees plenty of room for branch development, those inwards, in order to induce clean growth, being left much closer on the ground. Though in

the latter case the volume of timber produced is comparatively less than along the margins, yet it is of greater value owing to the trees being straight and clean-stemmed, the only exception being the Corsican Pine, which, even when isolated, has little inclination to form stout side branches.

The soil being light and resting on gravel was peculiarly suited for the growth of the pines, none of which suffered from disease or insect attack, though the Weymouth had occasional patches of the aphid by which it is usually attacked around London. The Larch was practically free from canker.

During recent thinnings, a good opportunity was afforded of taking the actual measurements when felled of the various species of trees, these being as follows—

Austrian Pine, average height, 46 feet; cubic contents 9 feet					
Corsican	„	„	51 feet;	„	11 feet
Scotch	„	„	45 feet;	„	8 feet
Weymouth	„	„	42 feet;	„	6 feet
Larch	„	„	47 feet;	„	8 feet

It will thus be seen that the Corsican Pine has surpassed all the others, both in height and in the quantity of timber produced. In viewing the plantations from a distance, the leaders of the Corsican Pines soar quite 6 feet above those of their neighbours. The Austrian comes next in the quantity of timber produced, but not in height; and the Larch and Scotch are of about equal size, the Weymouth being equal to the latter in height but not in bulk of stem. But the Larch beats all in value of timber,

for, while that of the various species of Pine was difficult to sell at a remunerative figure the Larch-wood was readily disposed of at a fair valuation.

My experience is that as a rule timber merchants fight shy of purchasing any of the Pine family excepting the Scotch. This may be owing to prejudice or want of knowledge as to the value of timber produced by the Corsican or Weymouth; but, whatever the cause may be, the fact remains that the timber of both these species is difficult to dispose of at any but firewood rates. That of the Scotch, being better known, finds a ready market at about half the price of Larch, which latter, after all, is the most useful and profitable of any coniferous tree cultivated in this country, as the demand for this always exceeds the supply.

POPLAR

(*Populus nigra*)

THE Black Italian Poplar is a tree of very rapid growth, having been known to attain a height of 120 feet in sixty years. It is popularly known as the necklace-bearing and Canadian Poplar. The timber is white and used for flooring and, owing to its toughness and lightness, for many constructive purposes. When young, say, under forty years' growth, the timber is of comparatively little value, but after that age it commands a good price. For railway wagon brakes it has been found more useful than any other timber, though cast-iron brake blocks have now in many instances superseded it. Where the timber is conveniently situated for removal, trees of 2 or 3 feet in diameter will fetch from 1s. to 1s. 4d. per cube foot. The demand for this timber in box and packing-case making has greatly increased with the war.

In the Aspen, or Trembling Poplar (*P. tremula*), we have a native tree of considerable beauty and rapid growth. When suitably situated the Aspen will grow at the rate of nearly $3\frac{1}{2}$ feet per year. The timber when matured is largely in use for staves, and sells at about the same price as other species of the Poplar family.

The White, or Silver, Poplar (*P. alba*) is probably the most ornamental of the genus, and has a particularly pleasing effect when agitated by the wind, owing to the undersides of the leaves being covered with a white or silvery down. It is a tree of rapid growth, often attaining a height of 80 or 90 feet with a straight well-rounded trunk 3 or 4 feet in diameter. For soil it prefers and attains greatest perfection in a rich dampish loam or alluvial deposit. The timber is of considerable value, white when young, but brownish when fully matured.

The Grey Poplar (*P. canescens*) also produces valuable timber, light, tenacious and durable, and in point of size rivals the Black Italian species. The timber sells at 1s. 2d. to 1s. 3d. per cubic foot, when of large size and clean.

All the Poplars succeed best in a deep, rich and dampish loam, and not too exposed a situation. Being brittle-wooded, they suffer greatly during stormy weather.

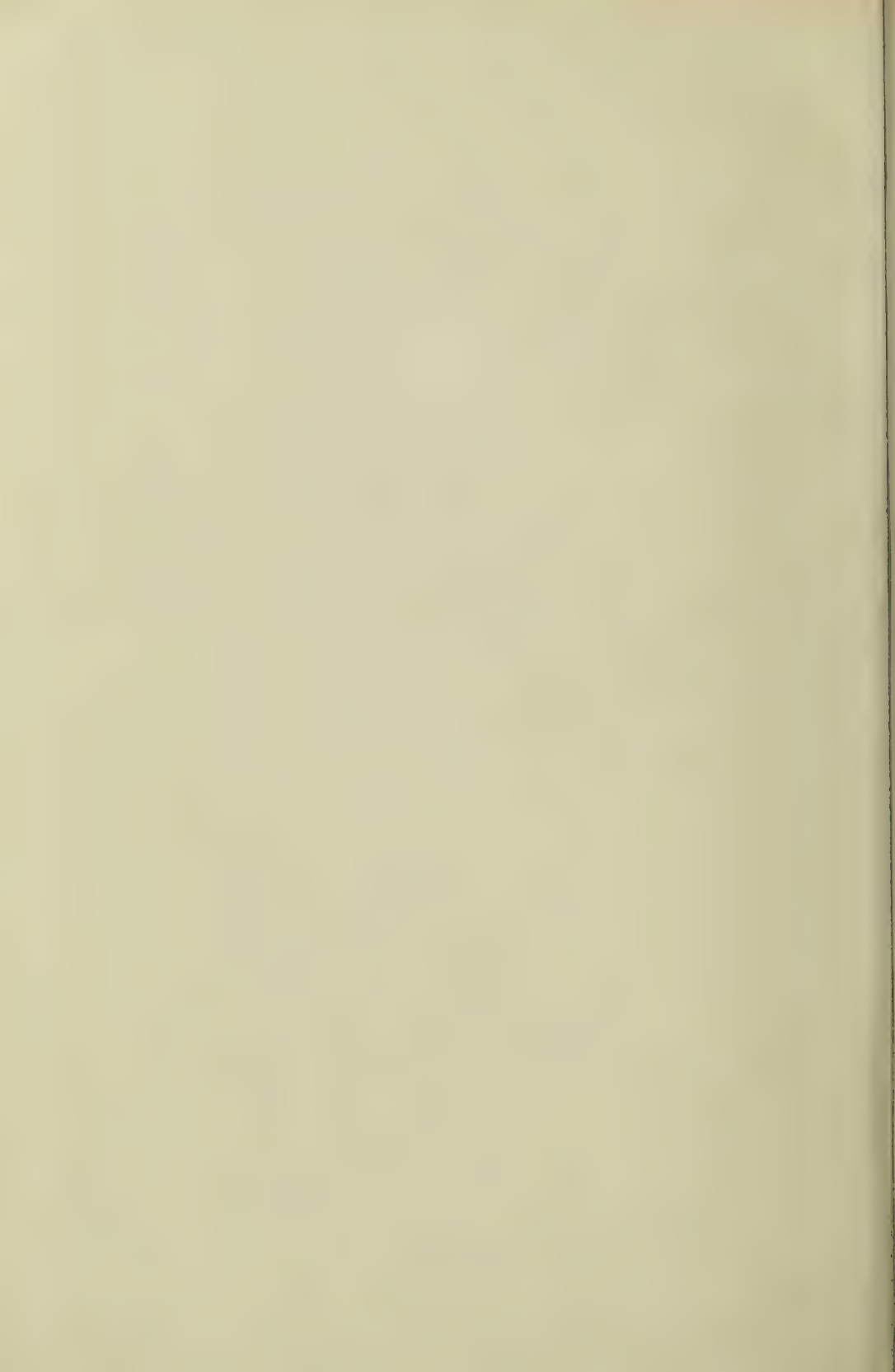
LOMBARDY POPLAR (*Populus pyramidalis*).—Considerable difference of opinion exists as to whether the Lombardy Poplar is a distinct species, or only a well-marked variety of the Black Poplar. Judging from specimens of both trees seen growing in this country, we are inclined to think that the true Lombardy Poplar is a distinct species, and not an upright form of the Black Poplar (*P. nigra*), though that there is a fastigiata variety of this species cannot be denied, of which many specimens may be seen both in and around London. It is, however, said to have originated as a sport from the Black

BRITISH GROWN TIMBER.



WHITE POPLAR.

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Poplar on the banks of the River Po, in Northern Italy, about A.D. 1700.

According to Bossier, the Lombardy Poplar is supposed to have originated in Persia, and from thence was introduced into Italy, where it has become a great favourite and is extensively cultivated. Regarding its introduction into this country, we are left in no doubt, as the first cuttings were brought from Turin in 1758, and planted at Blenheim in Oxfordshire. From thence it has become widely distributed, and being a tree of unusual appearance, of the simplest propagation and culture, and requiring but limited accommodation, it has been largely planted in many parts of the country, especially in situations where a restricted tree growth is desirable. The true Lombardy Poplar is by no means common around London, but the upright form of the Black Poplar, owing to its being an excellent town tree, and peculiarly suited for screen fences, or planting where a narrow branch-spread is desirable, has become widely distributed both in and around the great Metropolis.

Taking the Lombardy Poplar as seen plentifully in Cheshire, Hampshire, Gloucestershire, Herefordshire and Somersetshire, it differs much from the upright-habited tree as cultivated generally throughout Southern England. The true Lombardy has a deeply furrowed stem, and ashen-coloured bark on the branches, while the leaves are much later in being produced than are those of either the Black Poplar or its strict-growing variety. The latter, even in old specimens, is wanting in the deeply fluted

stem which is so characteristic of the true Lombardy, while the upright growing branches usually cover the bole in flat and regular courses from top to bottom, whereas in the other, owing to each branch having of itself a naturally fastigate habit of growth, large portions of the trunk are revealed to view. There is a marked peculiarity about the Lombardy Poplar that is perhaps not shared by any other tree grown in this country, and that is its decided aversion to thrive when the branches becomes interlaced with those of any other tree. But it carries this aversion still further, for it positively refuses to thrive, even when associated in clumps of its own kind, should the branches interlace or come in contact with those of its neighbours. In such a case it will grow thin and attenuated, the side branches losing their leaves and dying back at the tips whenever they come in contact with those of their associates.

The Lombardy Poplar can hardly be described as a beautiful tree, though it is peculiarly suited for landscape effect, owing to its tall, spiry, column-like appearance. It is, perhaps, most suitable for planting in the neighbourhood of a town or country village, where it produces an effect almost akin to architectural embellishment. Planting single specimens in open places should be avoided, while clumps have a gaunt and incomplete look unless associated with lower-growing, roundheaded, or drooping trees. Avenues of the Lombardy Poplar are not in good taste, and long screen fences, for which it is admirably suited, would be much

less objectionable if broken up here and there by round-headed trees. In flat or low-lying districts, particularly near water, the Lombardy Poplar looks best, and is most at home. It also associates kindly with old ruins, and has a fine effect when rising out of pointed-headed Cypresses or Yews; but in all cases it is a tree that should be used sparingly and with the utmost caution. The Lombardy Poplar is a staminate tree, females being exceptionally rare and readily recognised by their more spreading habit of growth. So far as is known, the Lombardy Poplar has never been raised from seed.

For timber purposes the Lombardy Poplar is of little value, the wood being only of firewood quality, while the deeply fluted trunk would in any case cause an immense waste if cut into boarding, even for the making of rough boxes or packing cases. It is also a short-lived tree, and apt to become rotten at the core; but being readily raised from cuttings, of rapid growth, and suited for confined spaces and town planting, it has become widely distributed since its introduction into this country.

SILVER FIR

(*Abies pectinata*)

THE Silver Fir, which is a naturalised exotic tree, attains to an immense size in this country and produces large quantities of timber of second-rate quality. Sometimes it is difficult to dispose of the big, unwieldy trunks of Silver Fir, which when full grown will contain upwards of 200 cubic feet of timber. When thoroughly seasoned, and it should never be used in a green state, the wood is useful for temporary purposes such as fencing, shed-building and in the making of boxes and packing cases. The price is low, usually less than that of either Spruce or Scotch and we have sold large, clean trees at the round sum of 10s. or 20s. according to accessibility. The expense of removal is often considerable in the case of large logs of the Silver Fir, and this, as well as the second-rate quality of the timber, has lessened the value of the tree. The wood is light, with no great quantity of resin, and the tree, when young is apt to be injured by frost in the spring. It is unsuited for high-lying, exposed situations, succeeding best in mixed hardwood plantations in lowland districts where the soil is rich, deep and damp.

The price per cubic foot of Silver Fir timber varies greatly from 5*d.* to 10*d.*

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SPINDLE WOOD.

SPINDLE TREE

(*Euonymus Europæus*)

THE timber of the Spindle Tree was at one time in great demand for the making of spindles and distaffs, and is now used in the manufacture of skewers, toothpicks and knitting-needles. It was also considered one of the most valuable timbers for the making of certain parts of musical instruments. The timber is remarkably fine-grained, hard, and finishes off smoothly. It is uniformly white in colour with darker longitudinal lines.

The Spindle Tree is a native shrub, or small-growing tree, that is found in copses and hedges in several parts of England and Southern Scotland. From an ornamental point of view the Spindle Tree is valued, owing to the seed covering splitting open and revealing the pinky arils. The wood is rarely offered for sale, though a small parcel, said to be for the making of toothpicks, fetched 15s. per cwt. recently in the London area. American-grown timber is now almost exclusively used for the purposes to which our native Spindle Tree wood was applied.

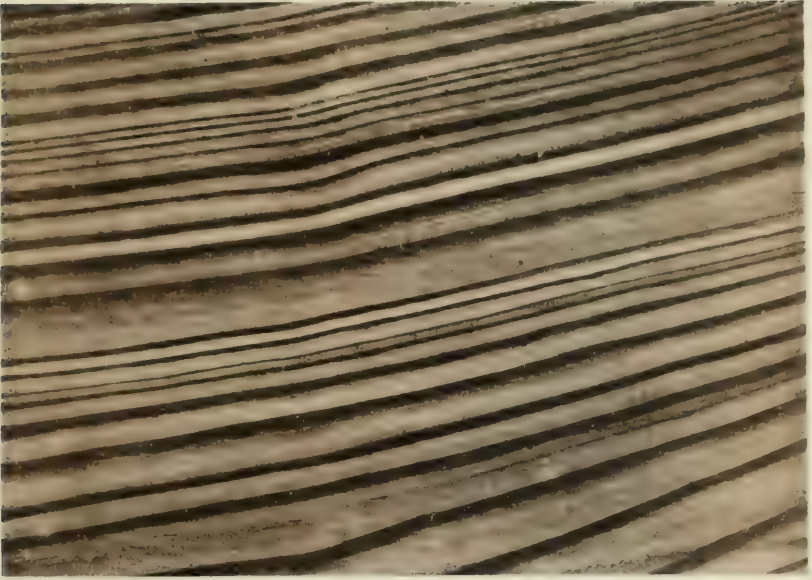
SPRUCE FIR

(*Abies excelsa*)

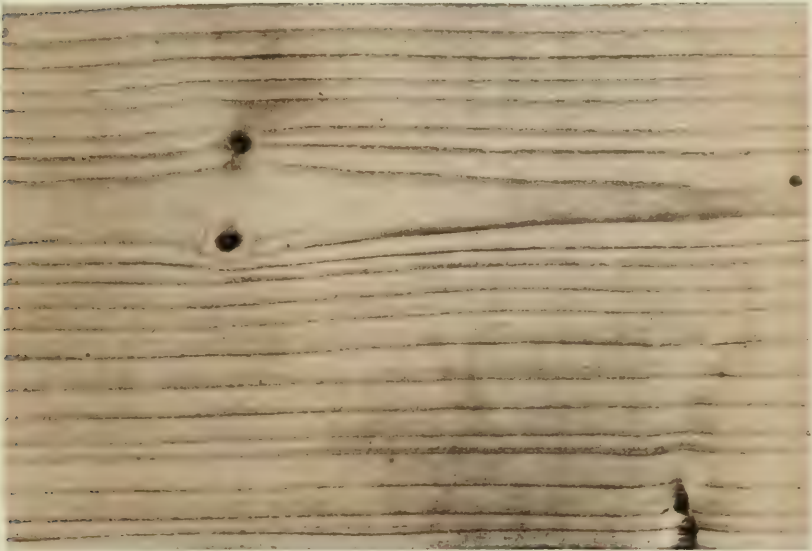
THE common, or Norway, Spruce has been extensively cultivated in this country for upwards of three hundred years. For shelter, game coverts, and for imparting a distinctly pleasing appearance when associated with hardwooded trees, the Spruce is of value, while the timber, which it produces quickly and in quantity, is valuable for many purposes—few, perhaps, of a permanent character.

Although as a marketable commodity in many parts of the country the timber does not attain a high place, yet when clean grown, it is well adapted for pit props, fencing rails, soles for drain-pipes, and when of large size it is used in the construction of outside sheds, joists and rough flooring. For packing-cases it is also in demand, and on the farm Spruce is useful on many occasions when the employment of timber is necessary. We have used Spruce timber thoroughly seasoned and of large size, for indoor work, and after forty years it appears quite sound. In fencing, too, this timber will last quite as long as that of the Scotch Pine. In Ireland, the timber is largely used by farmers in fencing, for shed-cleaving, and, as being lighter than Larch, in the making of ladders.

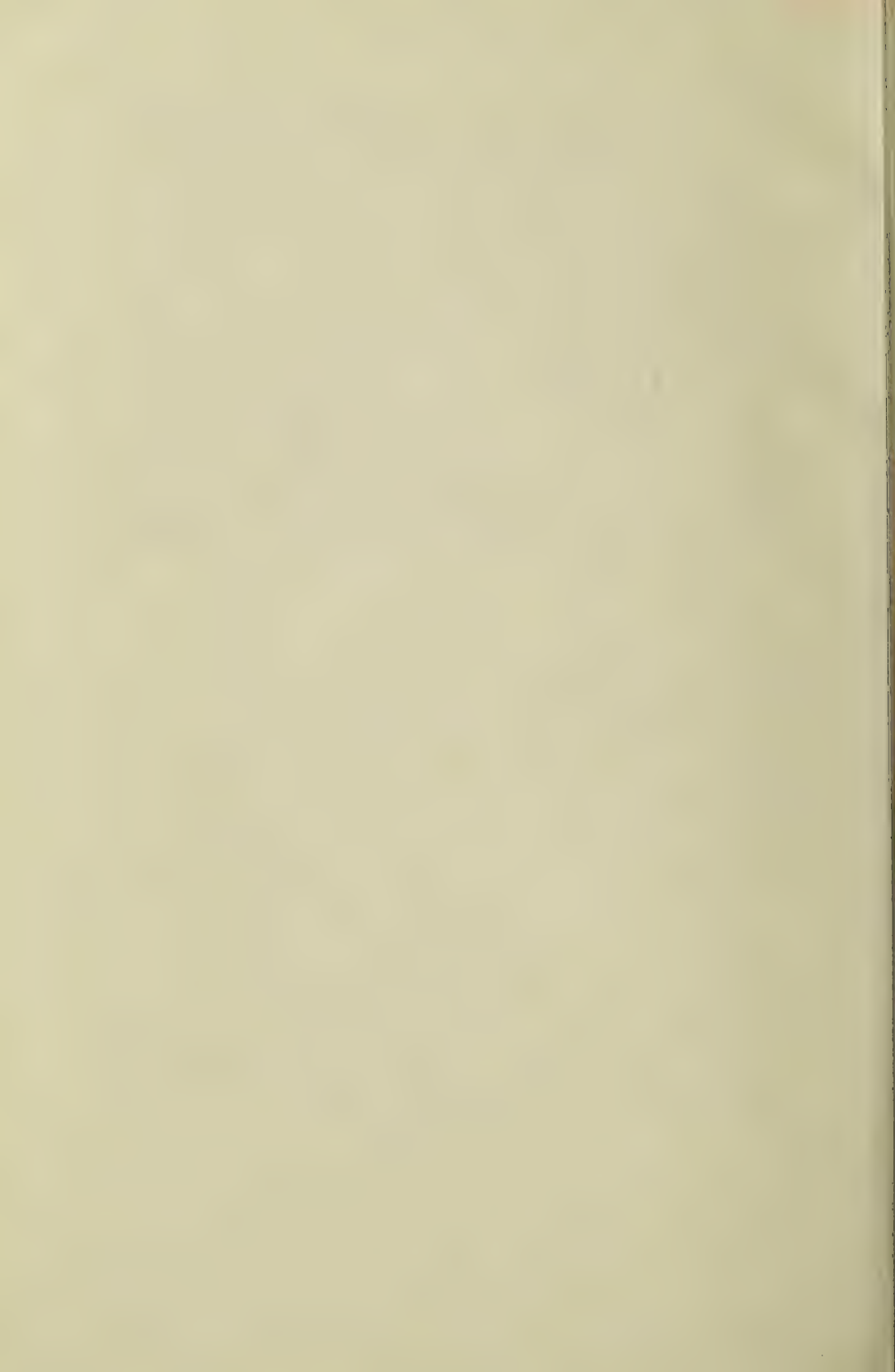
BRITISH GROWN TIMBER.



SILVER FIR.



SPRUCE FIR.



The usual price of Spruce Fir is rather lower than that of Scotch, though often, when lotted together, it is similar. It varies according to locality and local demand from 5*d.* to 9*d.* per cube foot. Since the war commenced, double the normal price has been obtained for Spruce timber; and in Buckinghamshire we saw splendid trees that had been purchased by one of our railway companies at the before unheard-of price of 1*s.* 4*d.* per foot where felled. This timber was to be utilised for many purposes, amongst others for sleepers and fencing.

The date of introduction of the Spruce Fir is not known, but it is mentioned by writers as early as the sixteenth century.

SILVER SPRUCE

(*Picea Sitchensis*)

FROM a purely commercial point of view the Sitka or Silver Spruce is probably the most valuable of any of the family to which it belongs. It is a tree of noble growth in this country, several specimens being well over 100 feet in height and with boles that girth fully 10 feet at a yard from the ground, these dimensions being attained in seventy-five years. It delights in a cool, moist loam and not too exposed situation, but when grown on gravel or any warm soil the foliage is distinctly meagre and affected by red spider. The timber, which is remarkably light for its bulk, strong and flexible, is of great value in the making of aeroplanes, and special logs find a ready market at highly remunerative prices for that purpose.

As will be seen from the frontispiece, the timber is close and fine-grained, six annual rings going to the inch. It works well under the tools of the carpenter. Where, as in aeroplane making, great strength and pliability are of the utmost importance, the timber of the Silver Spruce is used in conjunction with that of our best home-grown ash, with a thin plate of steel between.

The value of the timber of home growth is not fixed, though 1s. per cubic foot was obtained for a number of trees on an English estate recently. For afforestation purposes the Sitka or Silver Spruce is to be highly recommended.

TIMBER OF VARIOUS CONIFEROUS TREES

WITH the object of testing the quality of the timber of various species of coniferous trees cultivated in this country, we have lost no opportunity either of collecting specimens or conducting experiments. This, we need hardly add, has been attended with considerable difficulties, and it has not been easy to procure home-grown specimens of a suitable age and size to render the experiments thoroughly trustworthy. Fortunately we were enabled to carry out these experiments, by having had the management of parks and woodlands where numbers of the rarer conifers had to be removed in the ordinary course of thinning. The wind has, moreover, on not a few occasions, proved a good friend in providing specimens that would not otherwise have been obtainable.

As will be seen from the measurements given throughout the following notes, probably the largest and oldest specimens in this country of *Pinus Laricio*, *P. Austriaca*, *P. Ponderosa*, *P. Pinaster*, *P. Strobus*, *P. Muricata*, *Cedrus Libani*, *Cupressus Macrocarpa*, *C. Lawsoniana*, *C. Torulosa*, *Cunninghamia Sinensis*, *Araucaria Imbricata*, *Abies Grandis*, *A. Nordmanniana*, *Picea Nigra*, *P. Morinda*, *P. Sitchensis*, *Sequoia Gigantea*, *Cryptomeria Japonica*,

Thuja Gigantea, and *Juniperus Virginiana* have been cut down, and portions of the converted wood used in various ways in order to test their quality.

While carrying out these experiments, few things have surprised us more than the way in which the timber of certain species of coniferous trees is affected by the particular quality of soil on which it is produced; indeed, the difference between immature and nearly fully matured timber is trifling when compared with the difference in quality due to the variation in soil. One or two instances may be cited as examples: In thinning a plantation composed of *Pseudotsuga Douglasii*, *Pinus Strobus*, and *Picea Morinda*, fifty-three out of seventy-one specimens of *P. Strobus* were "pumped" or rotten at the core, and utterly unfit for use in any way. The trees were growing on sandy loam, had been planted twenty-six years, and contained, on an average, 25 feet of wood each. Now, having felled trees of the same kind on various other qualities of soil, and found the timber perfectly sound, deductions will not be difficult to make. A still more curious example of how coniferous timber is affected by the soil on which it was grown was illustrated a few years ago on an estate on the banks of Lough Neagh, in Ireland. A large number of fencing poles, Larch and Scotch Fir, were being cut from two neighbouring plantations of the same age and size, but growing on widely different soils—the one peaty and the other gravelly. The Scotch Fir timber from the peaty soil was soft, spongy, and

nearly white in colour, while that from the gravel was hard, firm, and of a bright yellow colour. So pronounced was the difference in the quality of the two timbers that the woodmen, in carrying the poles to the hard road adjoining the plantations, had not the slightest difficulty in stating from which wood the particular poles had been brought, that from the gravelly soil having a sharp ring like metal when thrown from the shoulder, whilst that grown on peat fell with a soft, dull thud. Larch timber grown on gravelly soil is usually "pumped" or rotten at the heart, and in one remarkable case with which we had to deal, every Larch had to be removed from a large mixed plantation of twenty-six years' growth, growing on soil of this description. Such facts as these are very significant, and show how careful we must be in condemning any coniferous tree when judged from the quality of the wood produced on any particular class of soil. As regards certain species at least, the observations must be extended over a fairly wide field of investigation in order to arrive at a just conclusion. In the following notes we have been careful not only to give the age of the tree from which the timber has been cut, but also the quality of the soil on which it was grown; and it may be well to add that in the matter of experiments, none of less than seven years' standing will be recorded. Greater attention, too, has been bestowed on such species as produce timber of sufficient size and of the best quality for economic purposes.

The arrangement is alphabetical—

Abies Cephalonica.—Age 33 years; cubic contents 27 feet; soil gravelly loam. Timber of good quality, and where it has been used in outdoor work for eleven years, seems at present in as good condition as Scotch Pine of the same age. The wood is yellowish-white, firm, medium in weight, and, owing to the quantity of resin it contains, works smoothly, and takes a good polish. Used for forming the sides of a temporary shed.

A. Grandis.—Age 49 years; cubic contents 73 feet; soil gravelly loam, with a foot-thick coating of decayed vegetable matter. Timber of excellent quality, very weighty, resinous, the concentric rings being closely packed. Used for boarding both in and out of doors during eleven years, and gives general satisfaction. The balsamic fragrance from the beautiful yellowish-white wood was, at the time of felling, distinctly perceptible many yards away, and was commented upon by the woodmen engaged in removing the specimen. We think the timber is quite equal to that of Silver Fir of similar age, but more resinous and weightier.

A. Nobilis.—Age 42 years; cubic contents 47 feet; soil rich alluvial deposit. Timber of good quality, and for indoor work, at least, to be highly recommended. It is light, but hard and compact, and of a creamy-brown colour. The colour varies greatly according to soil, that produced on gravel at high altitudes being reddish-yellow, harder, though equally light in proportion to the bulk. We were much pleased with the quality of the timber of this tree and consider that it is quite equal

to that of the Silver Fir, but the quality and colouring, as before stated, is evidently greatly affected by soil and site.

A. Nordmanniana.—Oldest tree 53 years, but others of 23 years and 18 years have been tested; soil in first instance, clayey loam, in second peaty; cubic contents 47 feet and 22 feet respectively. Timber reddish-yellow, fine and close-grained, and of excellent quality. Used for many purposes both in and out of doors, where it has been proved superior to that of the Silver Fir of even age. Specimens of the timber from boggy land in Ireland are remarkably hard and fine-grained, clearly proving that this tree is one of great merit for afforesting peat bogs. From experiments of many years' standing, we confidently expect that the Nordmann Fir will prove a valuable timber-producing tree in this country.

Araucaria Imbricata.—Age 47 years and 52 years; cubic contents 38 feet and 51 feet; soil in both instances loam on gravel. The timber of these trees was of a beautiful yellow colour, close-grained, firm, and worked and polished readily. Our experiments proved that the timber is not well suited for outdoor work, but when manufactured into household furniture it lasts well, ten years not seeming to change the wood in the least. The timber of young trees is notorious for its speedy decay.

Cupressus Lawsoniana.—Age 27 years; cubic contents 19 feet; soil gravelly loam. Timber of a pleasing yellow colour, very close-grained and hard, and works well under the tools of the carpenter.

Fences of posts made from the wood have stood a seven years' test satisfactorily; but the wood is evidently best suited for household carpentry. It is sweetly scented and very elastic.

C. Macrocarpa.—Age 38 years; cubic contents 43 feet; soil good yellow loam. Timber of first-rate quality, being remarkably hard and very close-grained. It is barberry-yellow in colour, but towards the centre reddish-yellow, very compact and close-grained, and it works smoothly under the tools of the carpenter. Its lasting qualities, both in and out of doors, are quite satisfactory. We consider the timber of this cypress superior to that of most of our home-grown woods.

Juniperus Communis.—Wood of a beautiful yellowish-brown colour, hard, but readily cut, and very aromatic. Made into ornaments, it seems to stand well, there being no perceptible difference in it after thirty-eight years.

J. Virginiana.—Probably the largest and finest specimen of this somewhat rare tree that has ever been felled in Britain was cut down to make room for building operations in the pretty village of Esher, in Surrey. The tree was of unusual proportions, with a beautifully clean and well-rounded stem, which was destitute of branches for 33 feet in length, and contained fully 51 feet of timber.

This is the wood used so largely in England in the manufacture of "cedar pencils," and that of the tree in question was of excellent quality and beautifully grained, the heart-wood being of a fine red colour with a band of deep yellow around the

margin. The fragrance of the wood is very remarkable, and in the case of the Esher specimen could be distinctly detected at a distance of about twenty yards. The soil which produced this, perhaps, unique tree, is deep, sandy loam, and the position might be said to be partially sheltered at least.

Picea Nigra.—Ages varying from 30 years to 50 years. We removed all the trees from a plantation, and so had ample opportunities of testing the quality of the home-grown timber. Timber nearly white, sometimes yellowish-white, soft, and long of grain, very light, and readily indented. It lasts well when kept dry and in an equable temperature; but it is of little value, comparatively speaking, for out-of-door work.

P. Sitchensis, the Sitka or Silver Spruce, is a valuable forest tree and attains to large dimensions when suitably placed. The timber is of good quality, being remarkably light, strong and long-grained, and the tree is recommended for afforesting purposes.

Pinus Cembra.—Age 43 years; cubic contents 29 feet; soil good stiffish loam. Timber soft and springy, easily worked and takes a fine and smooth polish. It is very light, and the graining so fine as to be hardly discernible. Thirteen years do not appear to have altered either the appearance or quality of the wood in the least.

P. Laricio.—Nearly all ages up to 71 years; cubic contents of largest 57 feet; soil gravelly. Timber of excellent quality, and well suited either for out or indoor work. It is yellowish-white in

colour, very resinous, tough and elastic, easy to work, and planes smoothly.

Many years ago we instituted a number of experiments with the wood of this tree cut from a specimen, 18 feet of butt of which contained 30 feet of timber, some of the planks being 27 inches wide. The timber was used for fencing-posts, rails, shed-cleaving, and the like, with very promising results. Later we examined the timber, and were surprised to find it so sound and well preserved, and in the case of that used indoors it had certainly hardened with age. Unlike the wood of several other species of fir, which get hollowed between the growths, owing to the loss of resin and shrinkage, that of the Corsican Pine remains perfectly smooth, the beautiful longitudinal dark yellow resin-containing portions being quite intact after eleven years' wear. The timber does not splinter readily, but wears uniformly and well when subjected to the almost constant bumping and rough usage consequent on railway travelling, a characteristic to which a large box which has been through many parts of England and Scotland since the Edinburgh Forestry Exhibition bears ample testimony. We consider this timber next to that of the Larch for lasting qualities, at least amongst such conifers as have been found of sufficiently rapid growth to warrant their recommendation for forest planting in this country.

P. Pinaster.—Age of several trees cut up 93 years; cubic contents 75 feet; soil gravelly, with a little loam. A goodly specimen that was straight as an arrow, and containing 99 feet of wood, was partially

uprooted during a storm, and advantage was taken of the opportunity to have the timber converted in various ways, so that its value for estate purposes generally could be determined. Owing to the great quantity of resin present in the timber, the tree was weightier for its bulk than any other species of conifer that had come under our notice, with the exception, perhaps, of *Abies grandis*. A great part of it was sawn into boards of 2 inches in thickness; and as many of these boards were fully 3 feet wide, their value for constructive purposes, had the timber been of good value and worthy of conversion, would have been great. The wood works beautifully and cleanly, taking a smooth glossy surface under the tools of the carpenter, and several of these 3 feet-wide boards were cut into 6 feet lengths, and planed smoothly for preserving as samples of the wood. The remaining boards were applied to various uses, but one instance of their lasting quality will be sufficient. A number, fully thirty, were placed as boarding for the floor of a dry faggot-shed or barn—a well-built structure, and thoroughly ventilated; on examining these boards several years afterwards, it was found that they were one and all perfectly rotten and falling to pieces, though they had been in position little more than eighteen months. Every board had to be removed, having become permeated with dry-rot to such an extent that when let fall on the ground they fell to pieces. This was all the more strange as the boards had been allowed plenty of air, not being nailed down or carefully arranged side by side, but simply

laid down with the double object of seasoning, and to form a temporary wooden floor beneath the dry faggots. When we take into consideration the size and age of the tree from which the planks were cut, as well as the great quantity of resin present, which rendered the log so weighty in transit, the case seems all the more remarkable. But it has long been known that the timber of this Pine is of no great value, and even for firewood purposes it can only be considered as third-rate.

P. Strobilus.—Age unknown; cubic contents 93 feet; soil vegetable mould, or shaly rock. Timber of good quality, clean, and easily worked, but much affected by soil and site. British-grown timber revealed but small difference when compared with that sent to the late Colonial and Indian Exhibition. We consider this a valuable forest tree for not too exposed parts of these isles, but it does not succeed well on too light or dry soils.

Pseudotsuga Douglasii.—Age from 25 years to 45 years; cubic contents of latter 57 feet; soil gravelly. Timber, when young, soft, and liable to insect attacks and sudden decay; when older, of a desirable yellow colour, hard and firm, and capable of receiving a high polish. It gets darker with age, hard and brittle, and difficult to work. For fencing-posts, boarding, and boat-masts, and in temporary work where not exposed to the weather, we have used the timber extensively, and in every case the result has been quite satisfactory. We do not, however, consider the timber of this tree equal in lasting properties to that of three other conifers,

whose merits, as regards quantity of timber produced and suitability for culture in this country, place them higher in the rank of such as are to be recommended for economic planting. The production of timber by the Douglas Fir is ahead of that of any other coniferous tree in this country of which we have kept a record, viz., 240 feet in fifty years, or nearly 5 feet per year for half a century.

Sequoia Gigantea.—Age 33 years; cubic contents 73 feet; soil loam on gravel, sheltered. Timber very beautiful, the ground-work being yellow, marked with deep red bands longitudinally. It is light in proportion to its bulk, compact, and works readily. We had the butt of the above specimen cut into 2-inch thick boarding, for the purpose of hut-making for charcoal burners, and, with every one else who saw it, were astonished at the deep, rich colouring and shading of the wood. Although the timber darkens with age, the lasting qualities are not remarkable, and the results of outdoor experiments were not very encouraging. For indoor work of various descriptions the wood is well adapted.

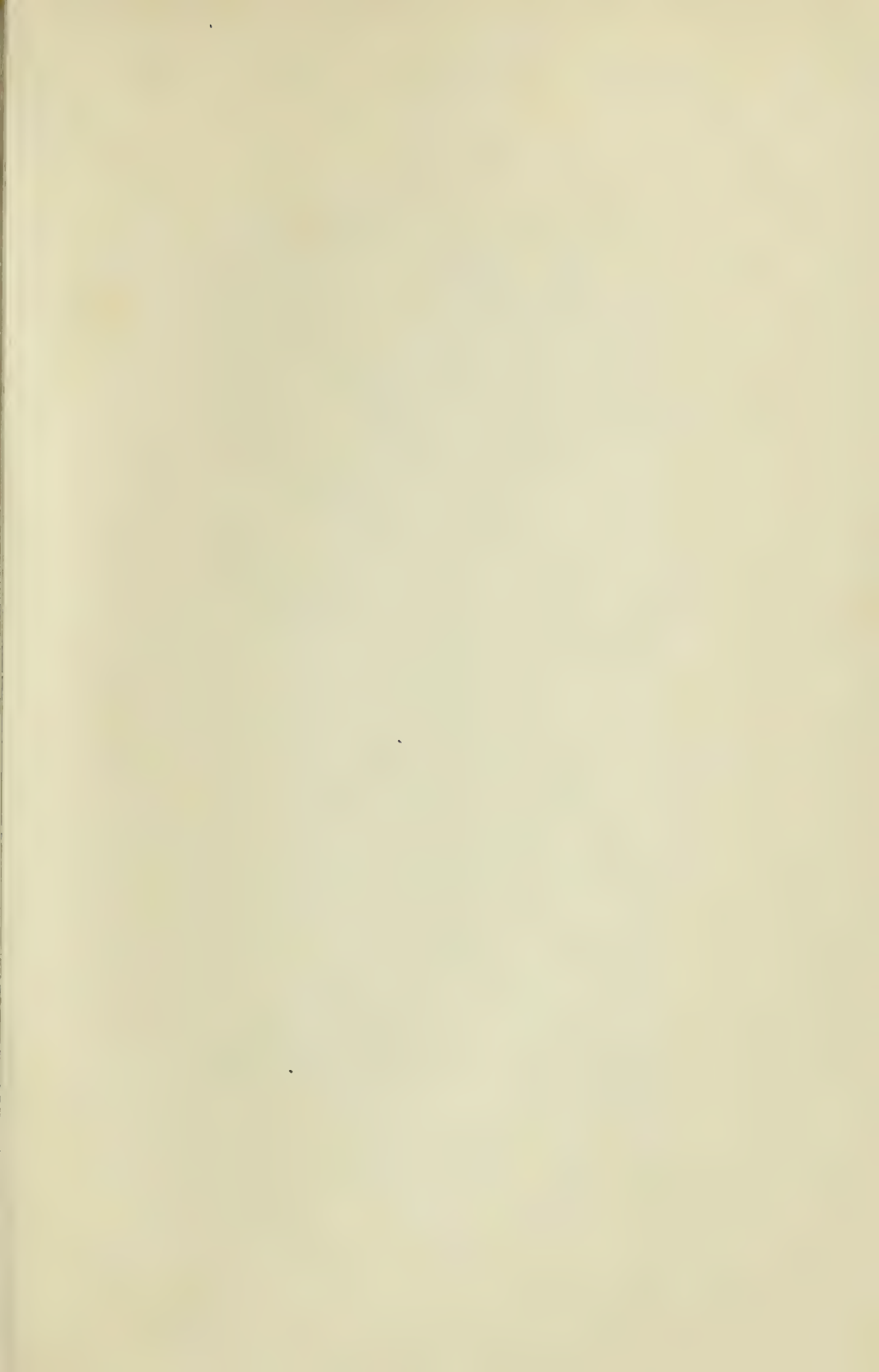
S. Sempervirens.—Age unknown; cubic contents 52 feet; soil alluvial deposit; sheltered valley. Timber of excellent quality, of a pleasing brick-red colour, very finely and closely grained, and capable of taking a high polish. It cleaves into long lengths, and is unusually free from knots and general timber defects. It is not used to any extent out of doors, but for furniture and room-panelling the home-grown wood seems to be peculiarly suitable,

Thuya Gigantea.—Age 31 years; cubic contents 31 feet; soil rich and suitable. Timber of a pleasing yellow colour, fine-grained, light in proportion to the bulk, and very readily cut up and worked. Our experiments with the wood for fencing purposes are not very encouraging, but it must be remembered that it was far from mature—in fact, could only be considered as in a juvenile state. Where used for indoor work, the results are favourable. We consider the tree one of the greatest value for the quick production of fairly good timber.

Tsuga Canadensis.—Age 53 years; cubic contents 37 feet; soil rich, damp loam; sheltered. Timber hard, heavy, rough-grained, and inclined to splinter. It works well, and takes a good polish. The slower-grown timber seems to be the hardest and finest of grain; that of old, rapidly grown trees being crooked and rough.

T. Mertensiana.—Age 28 years; cubic contents 31 feet; soil good rich loam; sheltered position. Timber yellowish-white, smooth, fine of grain, and will take a nice polish. We have used the wood for several out-of-door purposes, with the best and most satisfactory results. As fencing-posts, it equals the Larch of similar age, while for furniture it would seem to be well suited. We consider this a very valuable timber-producing tree for planting in this country.

Many other experiments were tried with the timber of the rarer coniferous trees, but they are unworthy of record.



BRITISH GROWN TIMBER.



SYCAMORE.

SYCAMORE

(*Acer pseudoplatanus*)

WHETHER from an ornamental point of view or in respect of the quality and quantity of timber produced, the Sycamore must be reckoned amongst the most valuable of introduced trees. For planting on the sea-coast or in fairly exposed situations it has many advantages, while even in smoky localities it can hold its own, particularly in the suburban districts of our larger towns and cities.

The Sycamore survives to a great age, the well-rounded trunk often attaining a height of 60 or 70 feet, and 20 feet in girth, while the far-spreading branches of somewhat tufted foliage of an unusually dark shade of green, impart to the tree an easy and graceful style of growth. As a field and hedgerow tree the Sycamore is largely cultivated, it standing exposure well, affording a great amount of shelter and shade and not seriously affecting the surrounding herbage.

The uses to which Sycamore timber is put are many and varied, for though essentially a fancy wood, it is, nevertheless, one of great utility, and enters largely into the work of turnery and furniture making. In addition to its uses for fancy articles, printing-blocks, bobbins, backs for brushes, rollers

for wringing and washing machines, parts of pianofortes and other musical instruments and calendar machines are made of Sycamore. Cabinet-makers use the wood for many purposes; and when contrasted with that of a darker colour it is very effective. Even in a young state, when fresh felled, large quantities of Sycamore are supplied for the making of brush backs and for toys and small ornaments. Bread plates are usually made of Sycamore wood, as also are milk-pails and dairy utensils generally. For all constructive purposes the whiteness of Sycamore wood is its great recommendation, but, unfortunately, through improper treatment, before and during seasoning, the timber is apt to become stained. Great care is therefore necessary to ensure that when cut into planking the boards are not allowed to become damp either by too close storage or during transit from the sawmill to the joiner's shed.

The price of Sycamore timber varies from 1s. to 2s. 6d. per cubic foot in the woodland. Special trees of large size and best quality, suitable for beetling beams in calico works, have been sold at as much as 4s. per foot, but this price is unusual. Trees of 40 cubic feet and upwards, if clean and sound, fetch from 2s. to 2s. 6d. per foot, and smaller trees for brush backs and turnery purposes about 1s. per foot. A large number of trees from field and hedgerow in North Wales were sold at 2s. 6d. per cubic foot where felled. Though not particularly strong, Sycamore timber is light, close-grained and easily worked. It makes excellent firewood.

BRITISH GROWN TIMBER.



WALNUT.

WALNUT

(*Juglans regia*)

WHETHER as an ornamental, fruit-bearing, or timber-producing tree, the Walnut is most valuable. The date of the introduction of the Walnut is supposed to have been about 1560, though remains of the fruit that have been unearthed in Roman villas, would lead us to suppose that in all probability the tree was brought to this country at a much earlier date.

Regarding soil, the Walnut is rather particular, in fact, to grow the tree to perfection, the best class of loam—such as is suitable for the cultivation of wheat—is a necessity. In deep, sandy loams, calcareous soils, alluvial deposit and strong loam on clay, the Walnut succeeds best, but it is not suited for exposed sites and is tender of spring frosts for the first few years after being planted.

When young, the timber is soft and yellowish-white in colour, but that of mature growth is of a rich brown and black, beautifully marked, particularly near the root or adjacent to where branches have been sent out, and capable of taking a smooth, bright polish. It possesses a great advantage in that it neither warps nor cracks, and in conjunction with its beautiful markings and lasting properties,

is thus rendered of great value for cabinet-makers' work. Sometimes the timber, particularly of old trees, is of a rich colour, dark brown with alternate streaks of a lighter and darker shade of reddish-brown and yellow pervading the grain. It is largely in use for rifle and gun stocks, for the most expensive kinds of furniture, and for veneers.

The market value of Walnut is somewhat erratic ; during the last thirty years we have sold the timber at all prices from 2s. 6d. to 4s. 6d. per cubic foot. Sometimes single trees are difficult to dispose of, even at the price of Beech, but when the expenses connected with the removal of isolated wind-fallen specimens or such as have been removed for building purposes are taken into account, the low price obtained is not to be wondered at. British-grown Walnut timber, when fully matured, is of excellent quality and considered by many superior to any that is sent from abroad, being harder, finer in grain, and more durable in a converted state. It may be ranked as one of the least common and most expensive of home-grown timbers.

The timber of the Black Walnut (*J. nigra*) is superior to that of the common tree, and when made into furniture, home-grown wood quite equals in colour and graining that sent from abroad.

WHITE BEAM TREE

(*Pyrus Aria*)

THE White Beam tree, though occurring only in limited quantities, is, nevertheless, by no means a rare native tree, and is usually found associated with a limestone or chalky soil formation. For exposed, wind-swept situations it is valuable, and on shallow soils it evidently succeeds best, indeed a rather dry soil is essential for its perfect growth and development.

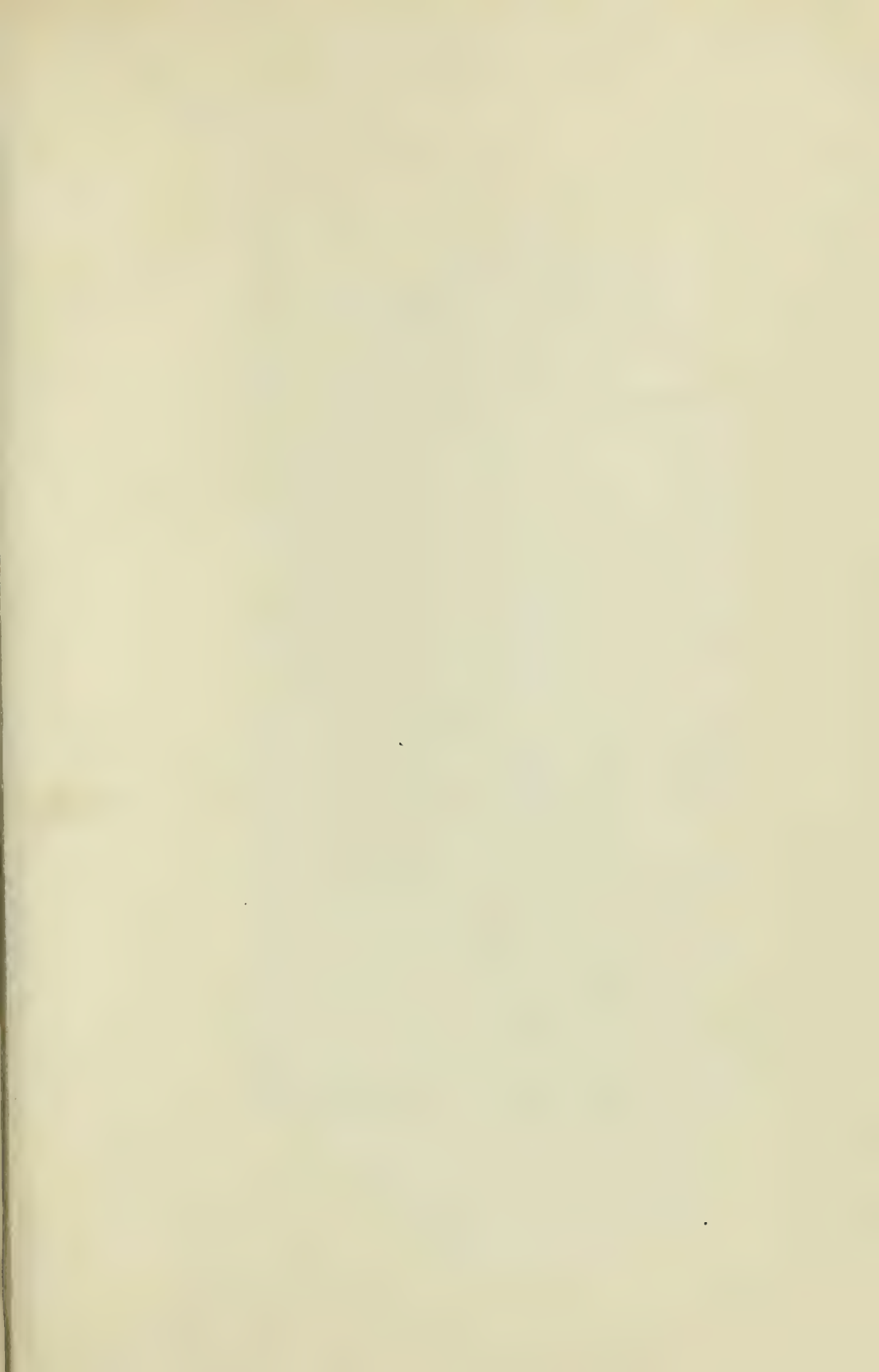
It is of somewhat upward growth, while the mealy whiteness of the undersides of the leaves when agitated by the wind renders it one of the most distinct and effective of native trees. The abundantly produced fruit is very ornamental, while in the winter season the smooth bark and prominent greenish-grey buds are most attractive.

Up to about the height of 20 feet the White Beam is of rapid growth, often adding from $1\frac{1}{2}$ to 2 feet to its height in a season. After that the rate of growth is decidedly slow. The wood is very hard, of a fine, close, even grain, yellowish-white in colour, and works well under the tools of the carpenter (see plate, p. 88). It emits a powerful smell which is retained even after the timber has been converted.

When of large size, the wood is useful for wheel

cogs, and it is also employed in turnery and for tool handles generally. Being only obtainable in small and erratic quantities, the price of the wood varies according to circumstances, but we have sold it along with other rare timbers at 1s. 6d. per cubic foot.

At Keston, in Kent, the writer sold quite a quantity of the wood of the Beam tree at 1s. per foot where felled.



BRITISH GROWN TIMBER.



WILLOW.

WILLOW

(*Salix*)

FOR ornamental planting, many species and varieties of Willow are to be recommended, but for profitable timber-producing purposes, the number is limited to two or three at most. The latter would include the White or Huntingdon Willow, the Crack Willow and Bedford Willow. Of the ornamental section, some of the best are the Babylonian, Golden and Silver Leaved varieties, but there are many others that might be included in a representative collection.

The general features of the larger-growing Willows are their rapidity of growth, suitability for damp situations, light, soft and comparatively valuable timber, and the ease with which they may be propagated and cultivated.

The White, or Huntingdon Willow (*Salix alba*) is the most generally cultivated, and under favourable conditions will attain a height of 80 feet. When room for development is provided, the branch-spread will almost equal the height. It is one of our most ornamental trees, and has a pleasing effect when associated with water, as when grown by the pond or lake side. The leaves, of silvery whiteness on the undersides, are particularly noticeable when stirred by the wind, this attribute causing it to rank

high for scenic effect in park-lands. For planting by the seaside it is a valuable tree, while it is readily propagated from cuttings and succeeds in dampish situations where few other species would thrive satisfactorily. The timber is of excellent quality, peculiarly light, tough and easily worked. For railway brakes, bottoms of carts and wagons, planking and joisting boards, and for several important purposes in connection with wheelwright work, the wood of the White Willow is much in request. In the manufacture of cricket-bats the timber of this Willow, or better still, the variety named "*cœrulea*," has no equal, but as we have appended a special note on the bat-making Willow, it is unnecessary to dilate further on its qualities here. The wood sells at all prices from 2s. 6d. to fully 10s. per cubic foot.

The Crack Willow (*S. fragilis*) has been so named from the very peculiar brittleness of the twigs of the tree. It is of rapid growth, having been known to attain a height of 30 feet in ten years, and a girth of fully 3 feet at a yard from the ground. As a nurse tree the Crack Willow is excellent, and on this account it is largely used for planting as a screen-belt to other less hardy species. For fringing rapid flowing watercourses it has, perhaps, no equal, the long, lithe roots being well suited for holding the soil in position. There are many varieties of the Crack Willow recognised by the basket-maker, the species having very regularly serrated, lanceolate leaves, glabrous on both sides, half an inch long foot-stalks, while the bark is rougher and more deeply

furrowed than that of any other Willow. The timber is of excellent quality, though not equalling that of the White, or Huntingdon, species for the purposes of the maker of cricket-bats, and wherever available is used for the floats of paddle steamers, portions of water-wheels, in ship-building for planking, and for brake-blocks in railway wagons.

The wood, when cut into planking, is decidedly reddish in colour, particularly towards the heart; but, indeed, after seasoning the whole timber has a more or less pinkish appearance, and for this reason the tree in some districts is known as the redwood Willow. The timber is also in use, in a minor way, for shoemakers' cutting boards, and is considered valuable by the cork-cutter for sharpening his knives; further, it is esteemed by painters for their charcoal crayons. Willow firewood is difficult to light and slow to burn, and was in the past largely used in the making of gunpowder. Timber of the Crack Willow sells, according to district and demand, at from 1s. 6d. to 2s. 6d. per foot.

The Bedford Willow (*S. Russelliana*) resembles the former, but is of more graceful outline and is of equal value as a timber-producing tree. It is of more rapid growth under favourable conditions than any other member of the family. The timber is light, tough, elastic, and not inclined to split or splinter, thus rendering it well adapted for the bottoms of stone and mineral carts, as also for the flooring of manufactories where workmen are passing to and fro continually. Railway brakes are made of this wood and lining for quarries; in fact, it is in request

for most purposes where teasing qualities of timber are more essential than hardness. Like the other species, the Bedford Willow succeeds best and produces the most valuable timber in a deep, moist loam, and will even do well on clay, but it will not thrive or live long in water-logged soil. The price of this timber is very similar to that of the former, but varies with local demand and the district where it is offered for sale, as also with the quantity offered.

The Goat Willow (*S. caprea*) prefers, like the others, a moist rich soil, where it will grow to 45 or 50 feet in height. For making gunpowder the charcoal from this wood is much in request on the Continent. The timber is used in this country for hoops and handles, and when large enough for purposes similar to those for which other members of the family are employed. The wood is remarkably light and tough and not readily indented.

Willow for Cricket-Bats.—At the outset it may be well to point out that the wood of the particular Willow from which the best class of cricket-bats are manufactured sells at a higher rate than any other timber that is cultivated in this country. There are many kinds of Willow found growing throughout the British Isles, though one alone produces the particular class of wood from which first-class bats are turned out. Until quite lately the timber of the White, or Huntingdon, Willow (*Salix alba*) was largely used in the making of these, but it has been found that a cross between that species and the Crack Willow (*S.*

fragilis), named *S. cærulea*, produces by far the best wood for the manufacture of high-grade cricket-bats.

In the trade the "Cricket-Bat Willow," as it is now known throughout England, is popularly designated as the close-barked Willow, in order to distinguish it readily from the open-barked or Crack Willow. Confusion generally exists in determining the various forms of Willow, but in *S. cærulea* the branches incline upwards; indeed, the tree has a semifastigiate form of growth, and the branches also have an upward tendency. The bark is of a dark grey hue, with long, straight, narrow fissures closely arranged, from which the term "close-barked" is derived. The leaves are of a bluish tint, covered with bluish-grey hairs on the underside, and long and narrow in shape, while an unerring point of difference between the hybrid and other Willows is that the tree produces only female flowers. It may be well to mention in connection with the Crack Willow, that the bark fissures are far more rugged and placed farther apart than is the case with the true Cricket-Bat Willow (*S. cærulea*). The great importance of recognising and growing for purely economic purposes the true variety will be apparent when it is mentioned that makers of cricket-bats will have nothing to do with any but the true "close-barked" tree, and the English bat-maker is keen to recognise the characteristics of the timber he requires, and will not stick at paying an exorbitant price for trees of the right kind.

As showing the value in England of the timber of the true bat-making Willow, it may be mentioned that in many instances that have come under our notice as much as 16s. per cubic foot, or six times the price of the best Oak, has been paid for trees of the true *S. cœrulea*. A single tree growing in London lately sold at £10, and in Hertfordshire eleven trees fetched the handsome sum of £80, while £20 was refused for four trees growing in a wood in Essex. Such prices as these are exceptional, though on a visit to two of the largest bat-making establishments in the Metropolis we were told that for several years past the average price paid for Willow worked out at 6s. per cubic foot. A well-known grower tells us that if planted in suitable soil a "set" or cutting, which usually costs 1s. 6d., will in about fifteen years be worth about £6.

The home of the true bat-making Willow is in the Eastern English counties, to which the manufacturer usually goes when wishing to purchase the most valuable timber for his special work.

The propagation of the bat-making Willow is simple, being effected either by rooted cuttings or sets; of these two the latter is the best and cheapest method. "Sets" are usually from 12 to 20 feet long, with a basal diameter of, say, 3 inches, the best being taken from pollarded trees; and straight, clean, branchless shoots are preferable. They should be stripped of all side shoots for about three-fourths of their length and only cut in spring. By placing these sets together in a ditch or pond for about a month rootlets will be emitted, when they

may be planted in previously prepared holes, which are formed by driving an iron rod or stake in the ground for a distance of, say, $2\frac{1}{2}$ feet.

Willows for Basket-making.—While the present war lasts and for years afterwards there is bound to be a dearth of Willows for basket-making, as we were dependent on Germany and the Netherlands for supplies. Here, then, is a chance for the owners of suitable land in this country to set to work at once and revive a time-honoured industry by planting up suitable grounds with the most approved kinds of Willows for basket-making. That the undertaking, if wisely carried out, would be a paying one is beyond question, and the excellent results attained at such places as Leicester, Somerset and Bedford clearly prove that Willow culture is a most profitable way of utilising naturally dampish land in any but the most exposed situations.

For the past few years the demand in this country for high-grade Willows has been greatly in excess of the supply, in fact, hardly one-fifth of our requirements are produced at home. Germany, three years ago, exported Willows and rods to the value of £40,000, representing an increase in five years of fully one-half; while of the manufactured articles in the way of baskets and basket-ware the total value of her exports exceeded £42,000. As giving some idea of our wants in this direction it may be stated that the total value of Willow rods annually sent to this country from the Continent is in round figures about £100,000, and of baskets and basket-ware fully £170,000. What a contrast to the state

of affairs at that period in our history when an important export trade was done in Willows by this country.

The Willow-working industry is a rapidly expanding one, and, owing to the increasing demand, the value of peeled Willows is gradually on the increase, present prices ranging from £24 to £38 per ton for those of best size and quality. These are in the main exported and used for high-class work in the basket trade, rougher unpeeled Willows that are largely in use for cheap packing-hampers and farm purposes bringing in a much lower price. Fruit baskets in immense numbers are annually imported from the Continent, one firm alone having sent over 150,000; while at the Leith basket-works, which mainly cater for the agricultural and fishing industries, thousands of herring baskets alone are sent out every month, and the packing-hamper department is of great interest and a special feature of this enterprising firm.

Willow or Osier culture is now mainly in the hands of the French for rods of good quality, the Belgians and Germans supplying an inferior and cheaper kind, probably owing to the quality of soil and varieties that are cultivated.

There are not a few persons who consider that in order to cultivate Willows successfully, any neglected, damp piece of ground, unsuitable for other crops may be utilised, and the cuttings simply stuck in the ground without preparation of any kind. This is a great mistake, as experience has long ago demonstrated that in order to make Osier

cultivation at all profitable, a low level, and naturally rather moist situation must be chosen, and the soil be deep, well-drained and carefully prepared.

Thoroughly drain the ground first, then steam-plough or trench the soil to a depth of about 18 inches, carefully removing all weeds; but particularly such troublesome kinds as the bindweed, couch grass, and dock. It is always preferable to take a crop of potatoes first from the land intended to be laid down for Osier culture, as this not only sweetens and enriches the soil, but allows of all obnoxious weeds being eradicated. Where, however, it is not practicable to crop the land first with potatoes, the soil should be well and roughly broken up and so left for a year, or for a winter, at least, before being planted with the Osiers. The best time to plant is from October to the middle of March. The sets, or cuttings, should be about 15 inches long, and formed of well-ripened rods, of one year's growth, and the straightest and cleanest portion of the rod only used. Three or four buds should, if possible, be on the top end of each set. In planting, insert the cuttings from 9 to 12 inches, into the ground, leaving 3 inches above soil, to form the stool that bears the future crops.

It is well to exercise great caution while inserting the cuttings, as, if the work has been delayed till the sap is rising, the bark readily strips away from the wood, and this is very objectionable, as the plants in such a state usually die. The sets may be placed about 15 inches apart, and the rows, which for convenience should be lined off straight, about

30 inches from each other. Of course, as regards distance, much depends on the quality of the soil and on the particular kind of Willow to be planted, but the above are good average distances.

For basket-making, etc., the best kinds of Osiers to use are *Salix triandra* and *S. viminalis*, but there are others of lesser value. A good basket-willow, whatever kind it may be, should, when green, twist from end to end without breaking. It is well to bear in mind that, in order to reap the greatest profits from Willow culture, only the very best kinds should be planted—indeed, next to preparing the ground, a judicious selection should be one of the main considerations. For the first year, at least, after being formed, osier-beds must be carefully attended to in the matter of cleaning and weeding. Hoeing will be found the most convenient method of getting rid of weeds, but, in the case of bindweed, hand-picking around and amongst the sets will be found necessary.

Cutting the Osiers must be done while the crop is dormant, or not later than the middle of February, but not during frost, which will injure and kill off parts of the stool. The cutting is done by means of a rod-hook, which much resembles a miniature sickle, and this should always be kept sharp, so that the cuts may be clean. Tie the rods together when dry, in bundles of three or four sizes, and either house or stack them. It should be borne in mind that rods are easily spoiled by being tied up or stacked whilst in a wet state, as they very soon become heated, which makes them brittle and

utterly valueless for the purpose intended. What is known in England as "bolting" is simply taking a number of Osiers, of as nearly a size as possible, and laying them on a twisted wand, at the same time keeping the butts all one way, and level, then drawing them tightly together—not, however, to such an extent as to injure the bark—with a rope and two levers, and finishing off by tying the wand. The wand should be at 14 inches from the butts. A bolt of rods should measure 40 inches round the band.

In forming a Willow bed, the following short rules should be observed—

(1) Willows will not succeed well in peaty, sandy, or water-logged soils; rich, well-drained loam, that can be flooded at will is the most suitable.

(2) Trench or plough, and thoroughly clean or pulverise the ground before planting.

(3) Plant only the best kinds, studying soil and market, and avoid a mixed crop.

(4) From November to March insert the cuttings about 9 inches deep, avoiding such as are bark-chafed, and tramp firmly.

(5) Keep the beds clean and free from weeds.

(6) Cut the crop close to the ground; pollard willows soon decay and in that state harbour injurious insects.

The following estimate of the approximate cost per acre of Osier culture, and the returns therefrom for the first three years will be of interest.

FIRST YEAR.

	£	s.	d.
Ploughing the ground and planting	4	10	0
Hoeing and other attention	1	5	0
15,700 Willow cuttings (<i>Salix viminalis</i>)	10	0	0
Rents, rates, and 5 per cent. interest on capital	2	12	0
Harvesting	0	18	0
Yield first year, 3 tons, value	19	5	0
Loss	£10	5	0

SECOND YEAR.

	£	s.	d.
Rent, rates and incidentals	2	10	0
Hoeing and cleaning	1	8	0
Harvesting	1	10	0
Yield about 5 tons	5	8	0
Profit	£14	12	0

THIRD AND SUBSEQUENT YEARS.

Expenditure £6. Yield £24. Profit £18.

If the ground is properly cultivated, and losses made good, the plantation should give a yield similar to the third year for fully a quarter of a century.

In the low-lying districts between Taunton Bridgwater and Langport, in Somerset, Willow or Osier culture is a considerable industry. The system usually adopted is as follows: the owner or tenant of the land planted to Willows (entailing an initial outlay of, say, £12 to £15 an acre) keeps the land free from weeds to prevent choking the osier sets by hand-hook. This means an outlay of from 18s. to 31s. per acre per annum if properly done.

The crops are measured and usually marked out in half-acre lots and sold, say, in October or November. The purchasers cut and remove them and in some cases convert them into baskets, basket-chairs and the like. In other cases the purchasers select and properly bundle the crops into the regulation size bundles and sell them to dealers.

The results of some of the sales last season were as follows:—One field of $11\frac{1}{2}$ acres realised £132, and the first two half-acres, being remarkably good withies, made £19 10s. Three other fields, containing 16 acres in all, made £161 10s.; and three others, containing $22\frac{1}{2}$ acres, £222 2s. 6d. The agricultural annual rental value of this land when pasture, before it was planted to Willows, was under £2 per acre.

YEW

(*Taxus baccata*)

THE Yew is a native tree of small growth reaching a height of about 40 feet, with a short, thick, often deeply-fluted stem and a wide-spreading head of branches that frequently exceeds in diameter the height of the tree. In the formation of hedges or for planting beneath the shade and drip of large trees, the Yew is of particular value, and, notwithstanding its rather gloomy appearance, is a decidedly ornamental evergreen tree and one that imparts a rich and warm aspect to the landscape wherever it is used. The Yew is remarkable, not only for its powers of endurance, but as being proof against damp, drought, bleak aspects and the poorest of soils, while it is not subject to disease or insect attacks—in fact, it is a tree that dies hard.

Yew timber is of excellent quality, and the country saying that a post of Yew will outlive a post of iron is well known. Being of unusually slow growth the annual layers of wood are comparatively thin and closely arranged, thus rendering the graining remarkable fine, which, coupled with the deep reddish tint of the wood causes it to be largely employed for many ornamental constructive purposes.

Yew timber, which is remarkably flexible and

BRITISH GROWN TIMBER.



YEW.

elastic, though formerly used almost exclusively for making bows, is still applicable to quite a variety of mechanical as well as ornamental uses. It is used by engravers, cabinet-makers, and the maker of mathematical instruments, as also for veneers, and by pipe and comb makers. For small ornamental articles such as bowls, punch-ladles, letter-boxes, and fancy boxes, it is still largely in use. We have used it with much satisfaction in the making of rustic wooden bridges, for which its weight, colour and lasting qualities render it admirably suited. Spanish Yew has supplanted our native wood in the making of the best quality of archery bows.

Regarding the price of Yew timber, it is so seldom offered for sale that there is no regular market, but in several instances it has been disposed of at the rate of from £5 to £7 per ton. A quantity of large trees of this kind containing from 35 to 40 cubic feet each, were sold last year on a private property near London at 2s. 6d. per foot where felled. These were exceptionally clean stems.

CHARCOAL-MAKING

AMONGST dead or dying industries of our woodlands that have been revived by the war, none is at present receiving a greater share of attention than the manufacture of charcoal.

Time there was, and not so long ago, when the merry voice and ring of the charcoal-burner's axe were familiar sounds in some of the Kentish and other forests of Southern England; but keen foreign competition, aided by preferential carriage rates, have caused this time-honoured industry to slip from our hands; indeed, it was almost forgotten till again called into existence for the battle-fields of France and Flanders. The trenches must be warmed without apprising the enemy of the existence of our men, and in order that this should be the case, and to prevent soaring signals of smoke, the trench brazier is filled with glowing charcoal.

Except, perhaps, in Kent and Surrey, and in the English Lake district, where small quantities of charcoal are annually produced for the hop kilns and iron smelting, charcoal-burning is a thing of the past. The expert charcoal-burner is now a difficult man to find, and an independent, highly paid workman when you have found him. Successive members of the same family in Kent have been

known to follow the occupation of charcoal-burning for fully a century and a half, and it is distinctly a skilled industry and confined to few.

Usually the men work in threes, and, having selected a piece of ground sheltered from the prevailing winds and in a position to which easy access to the wood can be obtained, a rough hut is erected for the accommodation of these nocturnal workmen. Water, sand or sawdust and turf are other requisites that must be provided as the work proceeds. A couple of large tarpaulin covers and half-a-dozen straw-covered hurdles are other necessities.

From the standpoint of economy in carting the wood to the kilns it might seem advisable to shift the site of burning from one part of the woodland to another. This, however, is not the case, as the hard, dry, ash-covered site, where charring has already been carried out, has its advantages; and the cost of transferring the workman's hut and tools from one position to another must also be considered.

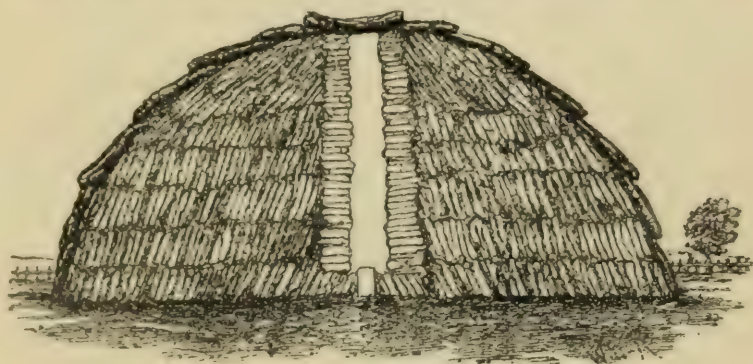
In charcoal-making, according to the quantity and quality to be obtained, several different methods are adopted, but in order to procure that of the best description the following system, which has been successfully carried out on a large estate for the past hundred years, is recommended. The timber carted to the charcoal yard consists of all kinds of hardwoods, preferably not under 2 inches in diameter.

Firewood and rough, unsaleable timber, as also inferior grades of heavy coppice wood, are mainly

utilised for the production of charcoal. The wood is sawn into pieces about 2 feet long, this being the most convenient size for building the kiln, and these are again split, if required, to some 4 inches to the side. When a sufficient quantity of wood has been cut up for the making of two pits, the building of these is proceeded with. It has been found economical to burn two pits at the same time, as two can be attended to as conveniently as one, and it is unnecessary for the men to sit up at night to watch each separately. The charcoal pits, one of which is shown in the accompanying sketch, are made of a broadly conical shape 21 feet in diameter, and about 9 feet high. The mode of their construction is as follows—

A strong stake is driven firmly into the ground and left protruding about a foot. Around this are placed small pieces of dry Ash of equal length, and standing as close to the upright stake as possible; around this ring another layer is placed in the same manner, and this process is continued until a circle 5 feet in diameter is obtained. A circle 1 foot in diameter, and having the top of the stake first driven into the ground as centre, is next made by placing the wood horizontally on the upright pieces and side by side, the ends of each piece being placed at the circumference of the circle already made, and directed towards its centre. Layer upon layer is built in this manner until the pit is of the required height, the wood used here being dry pieces of Ash 2 feet in length, but split rather smaller than the ordinary pieces. A sort of chimney is thus formed,

by means of which the pit is fired. Outside the core the wood is placed on end and reclining inwards, this being continued until the pits are of the required size. When the building is completed the pits are covered with newly cut turf, the grassy side innermost, beginning at the base and working towards the top, each line of turf overlapping the previous one by a few inches. The circular hole or chimney is left open for firing. Before turfing the top half of each pit it is carefully examined, and any crevices



between the wood packed full of small pieces of turf and sawdust to exclude the air. The turfs are cut about 1 foot in width, and of any convenient length. The quantity of turf required for two pits of the dimensions stated is seven loads.

When the pit is satisfactorily covered, it is fired by dropping a couple of shovelfuls of burning wood and some dry pieces of Pine or Ash into the opening left at the top; the top turf is then put on, which effectually shuts up the chimney, and the process of charring commences. The smoke is first seen issuing from the lower half of each pit, where the

chinks were not packed with sawdust, and ultimately it escapes from the whole surface.

Constant attention is required day and night during the period of burning, especially should the weather be stormy, as the wind, by striking on a particular part of the pit, causes that side to burn more rapidly and fall in. When this occurs the hole must at once be filled in with rough logs, which have been set aside for the purpose, and re-covered with turf.

When the weather is mild the pits burn uniformly, require but little attention, and produce the finest charcoal. The time required for burning will vary with the size of the pit, the quality of wood, the method of covering, and meteorological conditions. From six to seven days are usually required for pits of the above dimensions, but smaller kilns only covered with grass, fern and a little soil, may be ready for uncovering in from two to four days. Long experience has, however, proved that by the slower process of charring the best charcoal is produced, but the cost is higher. By covering the pits with grass and fern, as is often done, a considerable saving is no doubt effected, but where turf is available there can be no question as to its superiority over the former, and on the boundaries of most woodlands it is readily procurable at the cost of cutting. As the charring proceeds, the turf gradually disappears, until only a slight covering of burnt earth remains. When the pits have burned out and become cool, it is found that they are reduced to rather less than half their original size.

The charcoal is extracted by means of a specially constructed rake, resembling a light drag, but having much finer teeth, and after it has become quite cold is stored in a shed until required for use.

The very finest charcoal, superior to that which is generally sold, is produced by this method. The expenses connected with making it are, however, a little heavier than usual, owing to the slower system of charring, the use of larger wood, and the extra cost of covering the pit with turf. As to the cost of producing charcoal by the above method, this will vary greatly, much depending on the distance the wood has to be carted and on the cost of labour in the particular district.

The price paid to the charcoal-burner is 7*d.* per bushel, or about four guineas per ton, which may seem high, but when we consider that it is specialised work that is confined to few and attended with grave risks and discomfort, the amount earned is not excessive. It should also be remembered that, previous to lighting the kilns, sufficient rough, not corded, wood has to be sawn and split, and the pits carefully built and covered, not to speak of the constant attention required, both day and night, wet or dry, for from three to six days, during the charring process. The usual price for burning charcoal when the wood is corded is 35*s.* per ton.

Fresh-felled wood is rarely converted into charcoal, the greater portion of that used being thinnings of the previous season. The proportion of wood to charcoal varies greatly, much depending on the size, quality, and maturity of the timber. Having had

occasion to purchase charcoal lately, we found the price, retail, to be 2s. 6*d.* per bushel, or in quantities of not less than a ton, £14, for that of fair quality.

From about the twelfth century onwards, Scotland, where wood was abundant, produced annually a large quantity of charcoal iron; and in 1660 the Navy Commissioners nominated John Evelyn to investigate the denudation of forests owing to the manufacture of charcoal for iron smelting, and the following quaint extract from his Report will be interesting: "Nature has thought fit to produce this wasting ore more plentifully in woodlands than any other point, and to enrich our forests to their own destruction—a deep execration of iron mills and ironmasters also." The Lorne Works, in Argyllshire, were started in 1753, and annually consumed upwards of 3000 tons of lump charcoal.

The Sussex and Kentish forests at one time supported many of the familiar charcoal-burners, and right brawny and thrifty were those denizens of the woodland, with their rustic wooden huts and piles of rifted firewood; but the industry was almost a thing of the past till again called into active existence by the exigencies of the war.

COPPICE AND UNDERWOOD

FOR some years past the cultivation of coppice wood has been on the decline, but since the war commenced, the demand for all kinds of stakes and underwood has been considerable, with the result that prices have gone up proportionately.

With the shutting out of foreign supplies, the demand for coppice and underwood generally is bound to be considerable for many years to come. Foreign importations and preferential carriage rates have in the past dealt hardly with the profitable cultivation of coppice wood.

Coppice wood may either be grown alone or in company with large standard trees, but the latter must at all times be kept sufficiently thin, so as not to overshadow and kill out the undergrowth. There are advantages in the employing of standards in the protection they afford to the young shoots in spring, as also in the amount realised for the periodical thinnings to which they may be subjected. For this purpose the Oak is to be recommended, but such wide-spreading trees as the Ash, Elm and Beech, which produce so dense a shade as to kill out or seriously injure all vegetation that might spring up beneath them, are to be avoided. Generally, where the health and vigour of the

coppice wood are points of first consideration, it will not be advisable to allow the standard trees to occupy altogether more than about one-fifth of the wooded area; and even then, the lower branches should be pruned off, so that the effects of shade will be mitigated as much as possible.

As to the woods which coppice most freely, the Ash, Oak, Hazel and Alder-buckthorn occupy the first rank, at least, in a profitable sense; the Elm, Willow, Beech, Birch, Hornbeam, Alder and Sycamore occupying a second; but, as before stated, the nature of the soil, and in a lesser degree the altitude and exposure, must determine the particular species that will succeed best. Thus Ash will do well where the soil is moist and loamy, the Spanish Chestnut in sandy or gravelly districts, while in rich plains and hollows the Oak will prove most remunerative. The Alder and Willow in marshy ground; and on bare and exposed situations, the Birch, Hazel, Beech and Hornbeam will succeed best.

The preparation and planting of the land for coppice are similar in all respects to that adopted for the growing of an ordinary timber crop. Where the ground is too wet, draining should be judiciously carried out, while trenching, although expensive at first, is amply compensated for in the increased growth and vigour of the underwood. The pits for planting may be made from $3\frac{1}{2}$ feet to 4 feet apart, and, if the ground has been previously trenched, of sufficient size to hold the roots without undue cramping. It is always well to keep the stools

tolerably close together, as the shoots take a more erect habit and are straighter and more valuable than when allowed too much space and side room. Two years after being planted, or at the end of the second autumn, the young trees, excepting such as it may be thought advisable to leave as standards, should be cut over near ground level. This cutting is a most important operation and should only be performed by skilled workmen, with tools of the best description, well sharpened. The cut should be clean and directed upwards, all splitting of the stems and tearing of the bark being assiduously guarded against as conducive to decay and the early death of the stools. After four years' growth the shoots should be thinned out, leaving, say, four on each stool, preferably the strongest, the work being carried out at any time from November to the end of March, but not during frosty weather.

Upon the kind of wood grown and the uses for which it is designed, will depend very much the length of time allowed for the maturing of the crop, for while Osiers might profitably be cut at the end of the second year, Ash, Oak and Chestnut would not usually, even on the best quality of soil, be felled sooner than from ten to twelve years, and the poorer classes of coppice wood, especially on light soil, at from twelve to sixteen years. It should be remembered, however, that the duration of the stool is usually proportionate to the length of the rotation adopted, and with good management, on fair soil, the best class of coppice wood has a duration of nearly a century.

In felling the coppice wood it is always advisable to cut as near the ground level as possible, the shoots sent up having the advantage of rooting in the ground and so extending the area of the stool. The system of allowing the stools, by careless cutting, to rise in some instances several feet from the ground is contrary to the best principles of management. A sharp billhook should be used for all smaller shoots, a light, well-ground axe for those of from 3 to, say, 6 inches in diameter, and the cross-cut saw for all over that size.

The coppice wood is usually sorted out after being cut down, the best poles being laid aside for the use of the hop-grower, the next size for pit props, or fencing, as the demand may be, and so on until every pole has been arranged according to the purpose for which it may be intended, the lop and branches being bound into faggots for fire or oven-lighting.

The following are the various uses to which underwood is applied : hoops, hurdles, crate rods, pea stakes, spars for thatching, withies for faggot-tying, sheep cages, hop poles, brooms, broom handles, skewers for butchers, chisel handles, plant stakes, whip handles, gunpowder wood and faggots. Profits will vary from 15s. to 25s. per acre, exclusive of the standards which are left, and the crop, according to age and quality, will realise from about £5 per acre downwards.

Great care is necessary to avoid damage to the stools when removing the fall, which is not usually done until just before the young buds are shooting

out, and consequently at the time when injury is most easily brought about. The trampling of horses and passage of wheels are most injurious, while the browsing of cattle should be carefully guarded against. Good roads are always a great advantage in a coppice plantation, and to these as much of the produce as possible should be carried for loading, thus avoiding damage to the stools.

Although the growth of coppice wood has its disadvantages, particularly in park scenery, yet it is valuable in this way, that should the crop from local circumstances not be found remunerative, the plantation can at any time be converted into a standing wood by allowing the best and strongest shoots from the stools to form the permanent crop.

The approximate cost of forming a coppice wood, per acre, is as follows—

				£	s.	d.
Trenching at 2s. per rod	.	.	.	16	0	0
5000 trees at 3s. per 1000	.	.	.	8	15	0
Pitting and planting	.	.	.	2	5	0
				£27	0	0

STRIPPING AND HARVESTING OF OAK BARK

SINCE the commencement of the war the price of Oak Bark has increased almost fourfold. With this upward tendency there is every probability that the stripping and harvesting will be general during the coming season.

The period of bark stripping and harvesting is one of the most anxious seasons of the year with the forester, as the quality of the bark is so largely dependent upon the weather during the time that intervenes between the stripping and stacking, or delivery, as well as upon the carrying out of the work at the proper time, to secure easy and expeditious peeling. In most cases, the time when the bud is just expanding into leaf is that which gives the greatest weight of bark of the best quality with the smallest amount of labour. By deferring the work, even for a few days, there is often a loss of weight amounting to as much as 10 per cent., and a great deterioration in quality. Even in the most favoured situations it is seldom that the season for stripping extends beyond twenty-eight days.

The advantages of early stripping are so well known that any comment on the subject is unneces-

sary; suffice it to say, that, immediately the bark commences to "run" freely, no time should be lost in making a start, and the work should be prosecuted with vigour and despatch until completed.

The proper time to commence barking cannot, however, be fixed with any amount of certainty, much depending on the season, whether early or late, as well as on the district of the country in which the operation is to be performed. During ordinary seasons, and in most parts of England, bark stripping commences during the third week in April, and continues for about a month, or until such time as the trees are in full leafage, whereas in some parts of Scotland, especially the North, the operation is frequently nearly a month later. No mistake can, however, arise as to the right time to start barking in any locality, as in all cases, the period when the bud is first bursting into leaf will be found the proper time for felling to insure easy stripping and the best quality of bark.

As the season of bark stripping is, therefore, of short duration, every preparation should be made beforehand—trees marked and numbered, tools collected in readiness, and squads arranged—so that an early start may be made. By deferring the work beyond the time stated above, there is not only a perceptible loss in weight, but also considerable deterioration in the quality of bark. Elaborate directions regarding the arrangements of squads and tools to be used are unnecessary, as almost every district has its own peculiarities in

these matters. The tools generally in use are heavy axes and the cross-cut saw for felling, hand-bills and saws for pruning, peeling-irons or chisels for removing the bark, scrapers for removing moss, and light wooden mallets for beating refractory bark or such as cannot be removed by the peeling-irons alone.

Previously to felling the trees, a man or stout lad is sent to remove the bark from the root upwards for a distance of 2 feet or 3 feet, which not only prevents its being injured when laying in and felling the tree, but is convenient for after-stripping as well. When the stools are intended for reproduction, great care is necessary to avoid tearing or loosening the bark from the roots.

After being thus prepared, the trees are felled in the usual manner, those under 6 inches in diameter being cut with the axe; if above that size, it is found an economy of time and timber to fell with the cross-cut saw. Following in the rear of the cutters should be a squad of men to clear the trunk and larger limbs of all branches down to 1 inch in diameter, leaving the limbs to be peeled as part of the tree.

Heavy timber and large branches are usually peeled where they fall, but it will be found convenient to have the smaller trees and branches carried out to some clear space adjoining the stacking ground, and peeled while one end is supported by means of two forked sticks placed against each other. When the bark of small branches cannot readily be removed by the peeling-iron, a smooth,

flat stone is brought into use, beside which the peeler sits and with one hand holds the branch on the stone, moving it along from one end to the other, at the same time applying the mallet with the other hand until the bark becomes loosened from the wood.

Here it may be well to caution against a too-frequent use of the mallet, which should never be brought into request when the bark can be otherwise removed from the wood, as all hammering and beating not only diminishes the quality of tanning, but has a tendency to blacken the fleshy part of the bark and cause rapid decay in a bad season.

The body or trunk bark is removed in lengths of from 30 inches to 36 inches, and in as large pieces as possible. A dry, open and airy situation, convenient to the work, but without the confines of the wood should be selected on which to harvest the bark, rather than a sheltered, humid spot. The drying racks, or ranges, may be fully 2 feet high, dropping somewhat to the side, and formed of forked sticks driven firmly in the ground, while stout rods are placed transversely upon these. It should also be arranged, not only to throw the rain off, but so that the ends of the bark may be facing the prevailing wind, thereby ensuring a current of air through and beneath the mass. After being carted or carried to the drying-ground, the small bark is spread out loosely on the stage to a depth of about 6 inches, and thatched or covered over with the larger pieces as a means of protection against rain. Each day's bark should be cleared up,

and put on the range the same evening, or oftener, if found necessary, during damp, showery weather. The white or fleshy part should be kept downwards and the larger pieces used as a covering to run off the rain.

During favourable weather, the bark will be ready for stacking in about a fortnight from the time it was placed on the stage; but should close damp weather intervene, it may be found necessary to turn the bark occasionally, thus adding to the length of time required for harvesting. It should, however, be remembered, that the less turning the bark receives after being placed on the stage, the better will the quality be. Well-seasoned bark has the fleshy side of a creamy colour, whereas, such as has been exposed to the sun or rain is of a dull brown, wanting in tanning matter, and consequently inferior in value.

As soon as the bark is thoroughly dry and ready for stacking, as may readily be determined by its breaking freely across rather than bending or yielding to pressure, it should be secured in a shed and ricked or delivered to the tanner.

In stacking bark, the rick should not be made too wide—say about 9 feet—but well hearted, so that the side pieces may have a good fall outwards to throw off the rain. The rick may be of any length, according to the quantity of bark on hand, and of a height proportionate to the width. The largest pieces of bark should be reserved for thatching the rick, this being covered over with a tarpaulin or waterproof cloth of some kind. In some cases

the bark is chopped previously to being sold, but as this necessitates having a large shed at command, the system is not generally adopted. There are, however, several advantages accruing from this method, not the least being, that the bark may be chopped up as it is removed from the drying-stands, thus saving the expense of stacking. Chopping the bark can also be done by the workmen during wet weather when not otherwise engaged.

In computing the quantity of bark before stripping, we have found the following data fairly reliable—

(1) A well-balanced tree with a good head will yield about 6 cwt. of bark for every ton of measurable timber, if branches down to an inch in diameter are peeled.

(2) Hedgerow trees usually yield about a ton of bark to every three tons of timber.

(3) Trees growing in close woodland are usually thin-barked, the yield being about a ton of bark to every four and a half tons of timber.

(4) Oak poles will average five tons of timber to a ton of bark.

Tall, clean stems, with small heads, such as are obtained when the poles are grown thickly together, give the smallest yield in proportion to the quantity of timber, and short stems with spreading heads the largest.

FIREWOOD AND FAGGOTS

THAT a very considerable quantity of the produce of our woodlands, in the shape of rough trees and branches, is annually consumed for fire-lighting and fuel is not sufficiently recognised, except by those who are directly connected with the trade. Returns to hand from the firewood dealers in London alone, show that the quantity is greater than would be supposed, and the normal trade has been much increased by the exigencies of the war. Vast quantities of firewood are being sent to France and Flanders in addition to charcoal and fire lighters, with the result that there is a dearth of all these at home which has sent up prices considerably.

Usually, firewood does not appear as an article of commerce, being sold in the district where it is produced. London and other large towns are exceptions, for large quantities of firewood, faggots and charcoal, are annually sent to these centres of consumption.

Charcoal is usually made at or contiguous to the site where the timber is felled, but faggots and firewood are sent to the London market ready for use, the latter being bound up in bundles of the required size and the former cut into billets ready for the fire. Large faggots, or "bavins," as they are called in Kent, have also a ready market and

are used in large quantities for kiln purposes, as also for converting into the small faggot or "pimp." Perhaps it is not so well known as it should be that there is a wide and marked difference in the quality of home-grown woods used for firewood. As to which kind should take first rank there is a great diversity of opinion, but probably in nine cases out of ten, Oak, Ash and Beech, amongst our commonly cultivated trees, would be voted to the first place. The age and quality will, of course, have a great deal to do with the heating properties of any wood, wood which is old and thoroughly matured having greater lasting and heating properties than the young and sappy. Decayed or decaying timber makes poor firewood, as also does such as contains a quantity of sapwood. Some woods, such as the Ash, burn well in a green state, others must be seasoned or dry for use:

Irrespective altogether of the price or the quantity in which they can be procured, the timbers of some of the rarer trees not only burn most freely but emit the greatest heat. As far as our experience of home-grown woods is concerned, Yew, when properly seasoned, approaches more nearly to coal than any other, both in heat-giving and lasting qualities. It burns slowly, gives out a fierce heat, throws out no sparks, and is comparatively clean. Yew-wood should be felled for at least two years before it is used as firewood. The use of Hawthorn as firewood is proverbial, and in conjunction with Apple and Pear wood is greatly valued. It burns very slowly and almost without smoke, emitting a great amount

of heat. Hazel-wood burns well and is highly prized where it can be obtained in plenty.

Taking all in all we are, however, inclined to place the Beech in the front rank as firewood. It is hard and lasting, gives out an even heat, and has the additional recommendation of being readily procurable at a moderate price and easily split into logs. Oak, where it can be cut from seasoned timber, is hard to beat; though the smoke is bad for the throat. When the draught is perfect and the smoke finds its exit by the chimney there is little to complain of in Oak as firewood.

Ash, as every one knows, is a quick burner, even when green; and Elm though a "dour" burner is very lasting, and when thoroughly alight makes a pleasant fire. Few home-grown timbers, however, burn so brightly as winter-felled and partially seasoned Plane, indeed, for a lively fire it has no equal, but is, of course, a scarce wood in England. Pine-wood makes a quick fire on account of the resin it contains, but the sparking is dangerous. Scotch Pine-wood, when old and resin-stained, makes a most desirable fire on a winter's night, and blazes with a glowing cheerfulness that finds a match in no other homegrown timber. Chestnut is not a desirable firewood; Birch burns quickly without emitting great heat, but Willow is to be recommended, though Poplar is somewhat objectionable. The addition of a few pieces of coal to a fire of such timbers as the Elm, Sycamore, Apple, and, in fact, all timbers when in a green state, greatly improves their burning properties.

The treatment of firewood rarely receives proper attention. It should be carefully stacked and protected from the weather for at least a year. Any cost that this may entail will be amply repaid by the increased value of the fuel. If a suitable building is not at hand, the wood stack should be thatched either with reeds or Birch branches; and the same applies to faggots, both large and small. Faggots are as easily built into a stack as sheaves of corn, while firewood cut into three-foot lengths occasions little trouble in building into a neat pile for seasoning. The age and dryness of wood has much to do with its burning properties, and timber that has become rotten by undue exposure in damp situations makes poor firewood.

In Kent and around London generally, firewood is usually stacked and sold by the cord which measures 14 feet long, 3 feet broad and 3 feet high, or 8 feet long, 4 feet broad and 4 feet high. A cord of wood, about 10 cwt. in weight, will make one thousand billets of firewood size. The price of a cord of firewood varies greatly with the district, accessibility, quality and demand, and has gone up fully 25 per cent. during the past two years. On an estate in Kent, twelve miles from London, the selling price before the war was 10s. per cord, but it is now 15s., and even at this figure the demand is greater than the supply. About 5s. per cartload is the usual price.

Large faggots for kiln and other purposes, 3 feet long and 24 inches in circumference when bound up, vary in price from 10s. to 16s. per 100; and

small faggots, called "pimps," in the counties bordering London, which a year ago could be bought at 3s. 6d. per 100, now fetch 4s. 6d. Before the war, owing to the making of faggots by pauper labour out of cheap foreign batten ends, home-made faggots for fire-lighting had decreased considerably in value.

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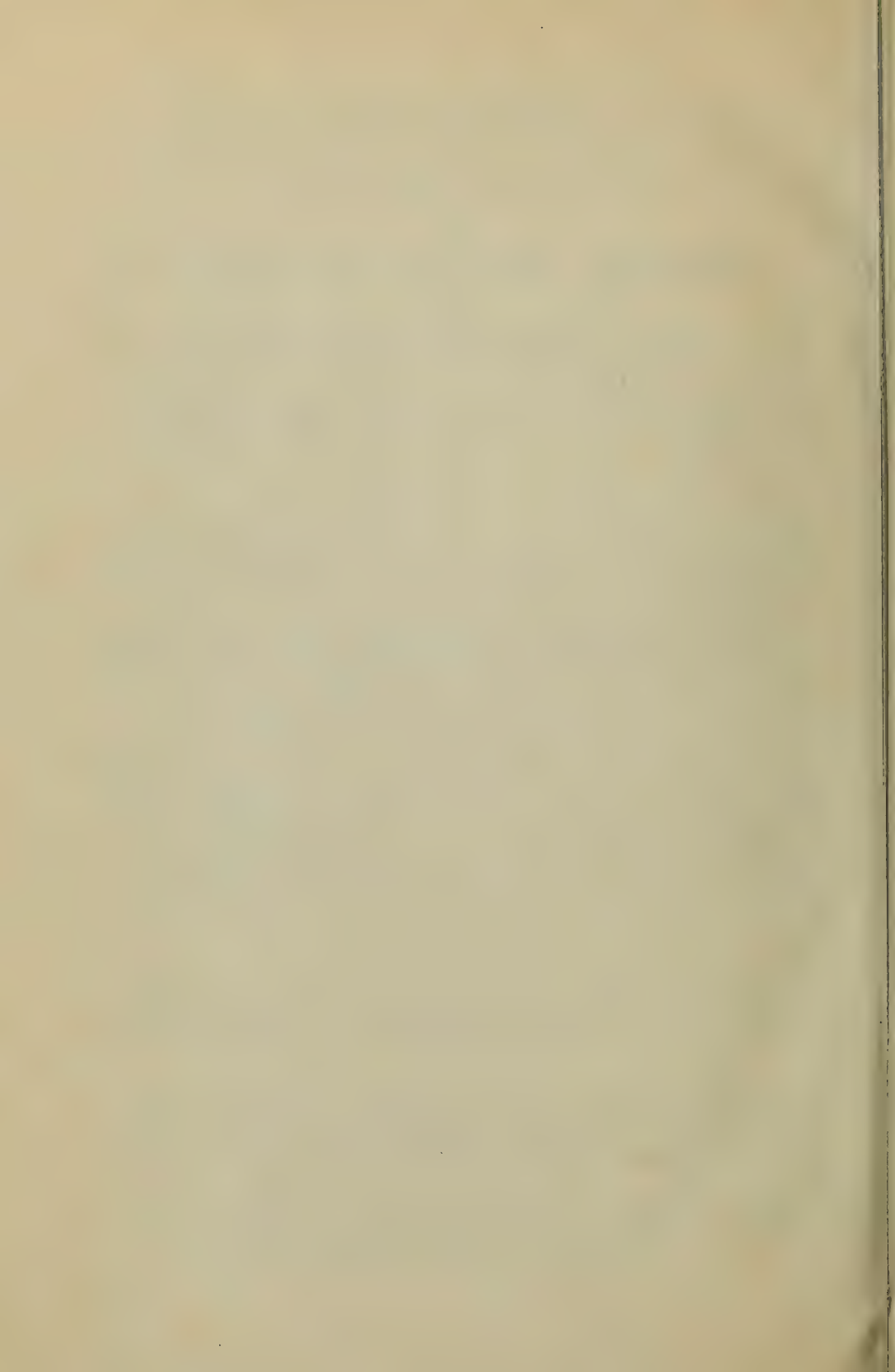
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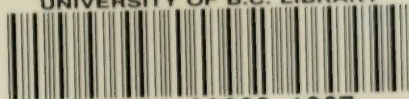
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